COUNTWAY LIBRARY
3 2044 115 035 479

RHODE ISLAND MEDICAL JOURNAL

August 1991

Volume 74, Number 8

Emergency Medical Services in Rhode Island

FRANCIS A COUNTWAY LIB OF MED
EXCHANGE OFFICE
10 SHATTUCK STREET
BOSTON MA 02115

WE HAVEN'T LOST A CUSTOMER IN FIVE YEARS BECAUSE WE STAND BY WHAT WE SELL.

Customer satisfaction means everything to us. So you can be darn sure that a computer system designed and installed by Health Information Systems, Inc. will continue to perform. Day after day, year after year.

We fulfill that promise in a number of ways. One is by keeping skilled technicians by the phones from morning until night, so your questions are answered fast. Another is remote diagnostics. We can actually operate your computer from any H I S Regional Center, placing your system in expert hands with a simple phone call.

Most important of all, when you need service that requires a visit to your office, we will be there. Fast. In fact, if we cannot be on-site, inside your office in minutes, we're too far away. And we would have to decline the opportunity to do business until an H I S office opens nearby. We are that serious about supporting your practice.

A product portfolio second to none.

We also take a tough stand on product development. There's a lot more than billing going on in a doctor's office. So we create programs that will make life easier in many ways. With accounts receivable programs like MedSTAR™, DentSTAR™ and CHIRO™. Plus MAPS™– appointment scheduling, REQUESTOR™– referral tracking, BKeeper– accounts payable, EMC– electronic media claims and much, much more.

We write these programs ourselves. And we service the hardware ourselves. And that's how we keep you up and running, as no other company can.

Find out why so many colleagues have chosen H I S.

We replace a lot of less capable computer systems. Almost daily. Yet for the past five years, not one H I S system has been replaced. Why? Because our customers know they have the absolute best in products and service. You owe it to yourself to see what makes them think that way.

Contact your nearest H I S Regional Center by calling toll-free 1-800-562-7069. In Connecticut, (203) 953-8909. We would be happy to send you more information.

HIS

Health Information Systems, Inc.

Tomorrow's Solutions in Today's Practice

MedSTAR, DentSTAR, CHIRO, MAPS, REQUESTOR, and BKeeper are trademarks of H I S.

RHODE ISLAND MEDICAL JOURNAL

THE FRANCIS A. COUNTWAY
LIBRARY OF MEDICINE
BOSTON, MA
AUG 14 1991

Volume 74, Number 8 August 1991

TABLE OF CONTENTS

EDITORIALS

349 Emergency Medical Services in Rhode Island
Robert H. Woolard, MD

Our Saintly Legacy

Dr Barbara A. DeBuono, Director of Health

CONTRIBUTIONS–*Guest Editor, Robert H. Woolard, MD*

355 **Trauma System Planning in Rhode Island**
Melinda L. Komiske, MS
William J. Waters, Jr, PhD
Catherine P. Millman, MBA

361 **Prehospital Emergency Care in Rhode Island**
Peter Leary
Robert H. Woolard, MD

365 **Immobilization of Skeletal Injuries**
Peter G. Trafton, MD, FACS

374 **A View From Another System– The Alabama Experience**
Ronald A. Shaw, MD

379 **Emergency Medical Residency Training and EMS: The Beginning of the Future**
Daniel L. Savitt, MD

383 **Disaster Management: Problems and Solutions**
Bruce Becker, MD, MPH, FACEP

COLUMNS

392 HEALTH BY NUMBERS
From Emergency Department to Inpatient:
Rhode Island Injuries 1988

394 THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Cover: Treatment of a fracture: a fifteen century wood engraving by the German artist Hieronymus Brunschwig.

EDITORIAL STAFF

Stanley M. Aronson, MD
Editor-in-Chief

Kimberly A. Poulton
Managing Editor

Hugo Taussig, MD
Book Review Editor

Seebert J. Goldowsky, MD
Editor-in-Chief Emeritus

EDITORIAL BOARD

***Edward R. Feller, MD**
Chairman

***Joseph Amaral, MD**
***Stanley M. Aronson, MD**
Edward M. Beiser, PhD, JD
Paul Calabresi, MD
***Richard A. Carleton, MD**
Margaret Cololan, MSJ
***James P. Crowley, MD**
***Peter A. Hollmann, MD**
***Frank J. Schaberg, Jr., MD**
***Fred J. Schiffman, MD**
William J. Waters, Jr., PhD

*Member of Publications Committee

OFFICERS

Kathleen C. Hittner, MD
President

Robert E. Baute, MD
President-Elect

A. Robert Buonanno, MD
Secretary

Frances P. Conklin, MD
Treasurer

Richard Wong, MD
Immediate Past President

DISTRICT AND COUNTY PRESIDENTS

Fred Vohr, MD
Bristol County Medical Society

William F. Coscina, MD
Kent County Medical Society

Orest Zaklynsky, MD
Newport County Medical Society

Frank J. Schaberg, Jr., MD
Pawtucket Medical Association

James P. Crowley, MD
Providence Medical Association

Joseph R. Dotolo, MD
Washington County Medical Society

Patrick R. Levesque, MD
Woonsocket District Medical Society

Rhode Island Medical Journal is owned and published monthly by the Rhode Island Medical Society, 106 Francis Street, Providence, Rhode Island 02903, Ph: 401-331-3207. Single copies $2.00 — Subscriptions $20.00 per year (members of the Rhode Island Medical Society — $5.00 annually). Published articles represent opinions of the authors and do not necessarily reflect the official policy of the Rhode Island Medical Society unless clearly specified. Advertisements do not imply sponsorship or endorsement by the Rhode Island Medical Society. Second class postage paid at Providence, Rhode Island. ISSN 0363-7913 POSTMASTER: Send address changes to RHODE ISLAND MEDICAL JOURNAL, 106 Francis Street, Providence, RI 02903. National Advertising Bureau: State Medical Journal Advertising Bureau, Inc., 711 South Blvd., Oak Park, Illinois 60302. Phone 708-383-8800.

There's more to Portable X-Ray Service than X-Rays.

Yes, our main business is to provide you with fast, efficient, diagnostic X-Ray services, but we have much more to offer . . . including a staff of people who really care.

- Diagnostic X-Ray Services
- EKG
- Holter-Monitoring*
- Ultrasound Services*
- Same day reporting
- 24 Hour Service
- Seven days a week

*by appointment only

We service the entire Greater Rhode Island area:

- Nursing and Convalescent Homes
- Shut-ins and Private Home Patients
- Post Surgical Patients

PORTABLE X-RAY SERVICE
OF RHODE ISLAND

Certified by the R.I. Department of Health. Reimbursement provided by Medicare, R.I. Blue Shield and Medical Assistance.

100 Highland Avenue
Providence, R.I.
331-3996

120 Dudley Street
Providence, R.I.
331-3996

154 Waterman Street
Providence, R.I.
273-0450

38 Hamlet Avenue
Woonsocket, R.I.
766-4224

EDITORIALS

Emergency Medical Services in Rhode Island

In the August and September issues of the *Journal* you will find articles which deal with emergency medical services (EMS) in Rhode Island. As the medical consultant to the Division of Emergency Medical Services at the Rhode Island Department of Health and the Director of the Department of Emergency Medicine at Brown University and Rhode Island Hospital, I have been involved in emergency care in Rhode Island for the past 8 years.

Part of the practice of the emergency physician involves the interface with rescue groups and the supervision of prehospital care. The highest quality of emergency care which can be provided to victims of trauma and the seriously ill depends upon high quality prehospital care. With the beginnings of academic emergency medicine on the horizon, Dr Daniel Savitt, the future Brown University Emergency Medicine Residency Director, and I hope to help mold high quality prehospital care in Rhode Island.

I often find a startling lack of information about prehospital care among my medical colleagues. Over the past few years so much has happened and continues to transform ambulance services, that an update is overdue. I am involved in several exciting developments in prehospital care such as the prehospital administration of tissue type-Plasminogen Activator (t-PA) study (PATS) with Drs David O. Williams and George McKendall, the evolving, but largely unfunded system of trauma care reviewed by Melinda Komiske which includes prehospital trauma scoring and triage to the state's trauma center, and new regional planning for disaster response now involving the country's largest Disaster Medical Assistance Team (DMAT) coordinated by Dr Bruce Becker. The near future (1994) will bring Rhode Island a Children's Hospital Emergency Department and even higher expectation for pediatric prehospital care as outlined by Drs Monica Kleinman and William Lewander.

This volume of the *Journal* should inform the medical community about EMS. There is a gulf to bridge before discussing the present and future of EMS. The physician community must recognize the providers of rescue and prehospital care as extenders of emergency care to the community. In my association with Emergency Medical Technicians (EMTs) at all levels, I have found them capable and dedicated partners in providing prehospital care. As hospital and office based health care providers, we must realize that EMTs encounter obstacles to care which require heroic efforts on a daily basis. They serve well the population of Rhode Island by providing over 70,000 ambulance runs each year.

High quality prehospital care depends both upon the commitment of the rescue workers and physician involvement at several levels. The protocols by which EMTs practice are written by the Rhode Island Department of Health EMS Medical Director, Dr Ronald Shaw, with input from the Rhode Island Chapter of the American Heart Association and Rhode Island Chapter of the American College of Surgeons (ACS) Committee on Trauma, chaired by Dr Peter Trafton. The daily radio dialogues between Rhode Island's emergency physicians and Emergency Medical Technicians shape each individual patient's treatment. All EMT training requires physician input for curriculum and delivery of lectures.

Although many physicians are involved, more physician input is needed to improve our system. I would encourage physicians to become aware and involved in this dynamic clinical arena. In an era of more powerful, effective and time-dependent therapies, such as thrombolysis, even more will be demanded of emergency encounters between EMTs and our patients. Fortunately, we can look forward to continued innovation and evolution in prehospital care.

Robert H. Woolard, MD

Our Saintly Legacy

While many Western healers and physicians have been venerated during the past three millennia remarkably few have entered the ranks of formal sainthood. Indeed, records indicate that only 40 of the many thousands achieving canonic sainthood have actually been physicians.

The pre-eminent saintly physician is Luke the evangelist, companion of St. Paul, and, according to second century writings, a physician of Greek origin probably born in Antioch. The third of the four Gospels in the New Testament, a masterpiece of eloquent poetry, is ascribed to him. Scholars have reviewed this book of the New Testament; and while it contains greater descriptions of miraculous healing than do the other three Gospels (ie, Matthew, Mark and John) they nevertheless fail to identify any part of the text which corroborates the alleged medical background of its author.

Saints Cosmas and Damian, fourth century physicians, were martyred during the reign of Diocletian. The two brothers were born in the Middle East, studied medicine in Syria and because they practiced their art without charging a fee they were known widely as the *Anargyroi* (ie, without silver). The brothers would not reject their faith and were accordingly crucified. It is said that arrows were then shot at them but rebounded upon the executioners. A century later the Emperor Justinian underwent a miraculous cure and dedicated a church in their honor, in Constantinople. The many murals, paintings and sculptures of the sainted physician-brothers depict them as youthful, attired in long robes and red hats and carrying the emblems of their trade – mortars, medicine cases, and urine glasses. Five English churches (in Kent, Sussex, Wiltshire and Herefordshire) are dedicated to their memory and their relics are found in Canterbury Cathedral and numerous other churches in Europe and the Middle East. The two, inseparable in history, also became the patron saints of numerous cities including Florence, Essen, Prague and Salamanca.

St Pantaleon, said to be born in Venice about the year 305, is yet another patron saint of medicine. He too was martyred during the years when Diocletian ruled Rome. His name survives in the narrow trousers originating in Venice, now called pantaloons.

There are other saints, not themselves physicians, whose names became eponymic of certain diseases because they had been associated in some manner with events of miraculous healing. Yet others were known as patrons of the medical profession.

The mode of martyrdom frequently determined the patronymic domain of each saint. Thus, for example, Apollonia received many blows to her jaw during her final torment and later became the patron saint of dentistry. St. Erasmus had his intestines torn from him and thus became the saint to be venerated when one was seized with abdominal colic.

The personal illnesses of the saints became yet another point of reference for those seeking their divine intervention. Thus, SS. John, Lupus, Thomas and Avertin were said to have epilepsy and they have thus become the patron saints of all movement disorders. The name of St. Avertin, a 12th century hermit from Tours, persists today as the secular trade-name of the basal anesthetic, tribromoethanol. St. Giles, an 8th century Athenian hermit was said to be lame and thus was later chosen as patron of the crippled. His benevolent intervention was repeatedly recorded and over 160 English churches bear his name.

There are a moderate number of eponyms in medicine carrying the names of saints. These include:

St. Agatha's disease: mastitis

St. Anthony's fire: ergotism

St. Dymphna's disorder: psychoses

St. Fiachra's disease: hemorrhoids

St. Gotthard's disease: hookworm (When the tunnels for the transalpine railroads were dug, near St. Gotthard's Pass, numerous workers developed ankylostomiasis. Modern epidemiologists ascribe the endemicity to the widespread fecal contamination of the tunnel floors and the subsequent penetration of the larval worm through the bare feet of the workers.)

St. Louis Encephalitis: (Named after the city, not the saint.)

St. Martin's evil: delirium tremens. (Probably because St Martin's feast day coincides with the pre-Christian feast of Bacchus.)

St. Main's disease: scabies. (The herb, teasel or scabiosa, is said to cure the disorder; in Europe, the plant is called *l'herbe de St. Main.*)

St. Roche's plague: (St. Roche was a profoundly pious Frenchman, born during the end of the 13th century. He devoted his life to the care of the ill, particularly during the pestilence of the 13th century including the great bubonic plague beginning 1347. He is said to have developed a bubo on his left thigh and numerous paintings depict this ulcer.)

St. Valentine's disease: epilepsy.

St. Vitus' dance: a form of rheumatic chorea. (Vitus, a 4th century Sicilian, would not renounce his Christian faith and was ultimately beheaded. During the dancing mania epidemics eleven centuries later, those who undertook pilgrimage to the shrine of St. Vitus in southern Germany were said to be cured of their involuntary movements and, through transference, the name St. Vitus affixed itself to the disease.)

Sanfilippo's syndrome: mucopolysaccharidosis (Named not after the saint but after the physician who first described this inborn error of metabolism in 1963.)

The historic records of most of these canonized men and women are incomplete. But it is unlikely that any of these pious souls could have envisioned that their names would have been immortalized principally by virtue of an association with some dreary human ailment. Someone observed that the ultimate test of fame is to have a crazy person imagine that he is you. To this, we may add the perpetuation of some names solely by their attachment to a dreaded disease.

Stanley M. Aronson, MD

Dr Barbara A. DeBuono, Director of Health

The state of Rhode Island and Providence Plantations has been widely known for the effectiveness and professionalism of its Department of Health. The recent selection of Barbara A. DeBuono, MD, MPH as the new Director of Health preserves and continues this tradition of excellence.

Dr DeBuono was born in New York and received both her undergraduate and medical education at the University of Rochester in New York.

She was awarded her M D degree in 1980. Dr DeBuono underwent residency training in internal medicine at New England Deaconess Hospital in Boston and subsequently completed fellowships in infectious disease at the Brown University affiliated hospital system. In 1984, she was awarded a Master's degree in Public Health at the Harvard School of Public Health and was appointed to the staff of the Rhode Island Department of Health in the summer of 1986 as Medical Epidemiologist. Subsequently she was appointed as Medical Director, Office of Disease Control within the Department of Health.

Much of Dr DeBuono's professional activities, beyond her administrative responsibilities, has been concentrated upon the growing public health problems of AIDS. Dr DeBuono is active in the teaching of medical students at Brown University and has published numerous scientific articles in medical journals including many in the *Rhode Island Medical Journal.*

Since Dr DeBuono has been laboring in our midst for much of the past decade, it would be gratuitous to welcome her at this time to Rhode Island. We do, however, happily embrace this administrative appointment assured now that the great tradition of preserving and enhancing the public health – borne so well by H. Denman Scott – will continue in the capable and energetic hands of Barbara DeBuono.

Stanley M. Aronson, MD
Kimberly A. Poulton

Cafeteria Workers Instigate Food Fight

"They were armed to the teeth," one customer said. "Carrots, tomatoes, broccoli everywhere." Cafeteria workers all over town have joined the American Cancer Society's **Great American Food Fight Against Cancer.** Now they're recommending foods that may help reduce cancer risk. Foods high in fiber and low in fat.

"I love to see people eat healthy," one worker said. "When I throw a big helping of steamed vegetables on someone's plate, I feel good inside."

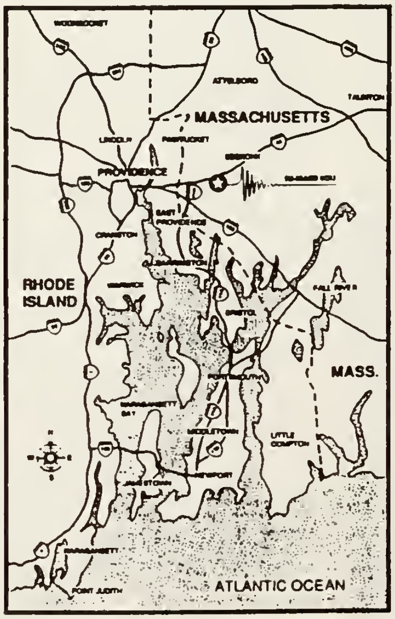
"When a kid reaches for an apple for dessert, it's just beautiful," said another emotional server.

So join The Great American Food Fight Against Cancer. Call **1-800-ACS-2345.** Ready? Aim. Chew!

AMERICAN CANCER SOCIETY®
Public Service Message

MAGNETIC RESONANCE IMAGING

RI-MASS MRI, P.C.
309 Taunton Ave. (Rt 44), Seekonk, MA 02771



- Prompt Scheduling (within 24 hours)
- Pleasant Outpatient Setting
- High Quality Images (Sent to your office within 24 hours.)
- Latest Generation MRI Technology (3D and MR Angiography available)

RI-MASS MRI is a state of the art magnetic resonance imaging facility conveniently located on Taunton Avenue just blocks from the state line. To learn more about RI-MASS MRI or to receive more information about our facility (Rx pads, patient brochures, etc.) please contact Ruth Nash (Site Manager) at **1-800-848-9661.**

Patient Scheduling
1-(800)-848-9661

RIMS
Insurance Brokerage Corporation

Insurance Professionals serving Health Care Professionals.

We do it better!

- Because our purpose is to serve RI doctors and allied health care professionals.
- Because our staff has 15 years of solid experience in medical liability underwriting.
- Because our board of directors is composed predominately of doctors with the same problems, stresses and concerns as you.
- Because we support political action in matters of health care benefiting all Rhode Islanders.
- Because our bottom line is superior service.

Phone 272-1050 — ask for Shirley and
Learn How We Can Do It Better For You!

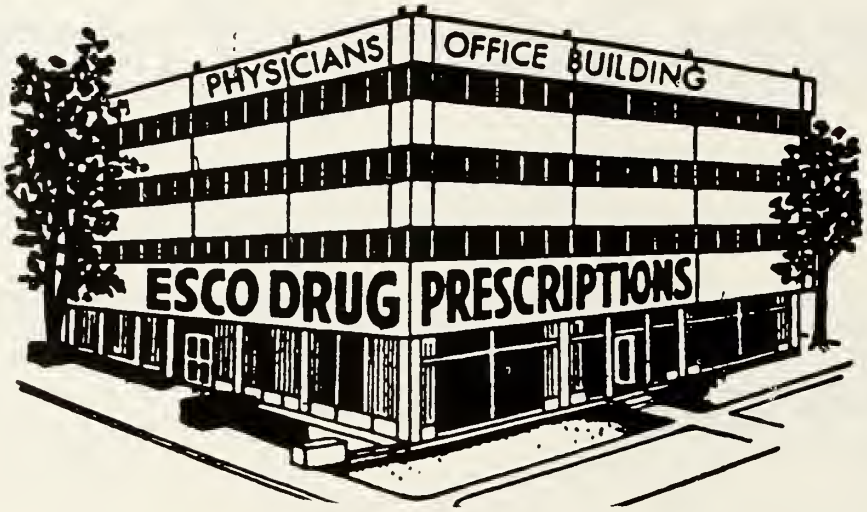
RIMS Insurance Brokerage Corporation
The Experts in Medical Liability Insurance

Now offering up to 2M/4M limits for select insureds.

Also offering workers' compensation.

RIMS Insurance Brokerage Corporation
One Hayes Street, Providence, Rhode Island 02908
Phone (401) 272-1050 FAX (401) 272-1051

PHYSICIAN OFFICE SUPPLY COMPANY
ESCO DRUG CO., INC.



110 Lockwood Street
Providence, Rhode Island

Mark S. Goldberg, R.Ph., B.S., M.B.A.
Pharmacy Manager
421-3250
FAX 621-9889

- vaccines
- injectables
- chemotherapeutics
- paper products
- surgical dressings
- specialty compounding
- trained orthotic fitter
- Jobst, Vairox, Warm and Forms
- RI Leading Diabetic Supplier

* BEST PRICES AROUND *

CALL FOR A PRICE QUOTE

STORE HOURS
Monday thru Friday 8:00 AM to 6:00 PM
Saturday 9:00 AM to 1:00 PM

Featuring Lederle's FLU-IMUNE™ (Influenza Virus Vaccine, Purified Surface Antigen Vaccine, Trivalent Types A & B)

Trauma System Planning in Rhode Island

Melinda L. Komiske, MS
William J. Waters, Jr, PhD
Catherine P. Millman, MBA

> ***Through the 1970s and 1980s the specialty of trauma surgery evolved as surgeons began applying combat zone approaches to saving the lives of seriously injured civilians.***

Responding to a request for assistance from the leadership of the Rhode Island Hospital Trauma Center, the Director of Health convened the Rhode Island Trauma System Planning Committee to develop recommendations concerning the need for trauma system planning and development, and maintenance of the Level I* Trauma Center's viability. After six months of study, the Committee made recommendations designed to begin strengthening the trauma system, ameliorate the financial strain of providing Level I trauma care and reduce the occurrence of trauma in Rhode Island.

Melinda L. Komiske, MS, is Chief of the Office of Health Planning at the Rhode Island Department of Health, Providence, Rhode Island.

William J. Waters, Jr., PhD, is Associate Director of Health for Health Policy at the Rhode Island Department of Health, Chairperson of the Rhode Island Trauma System Planning Committee and Clinical Assistant Professor of Community Health at Brown University, Providence, Rhode Island.

Catherine P. Millman, MBA, is the Health Facilities Planner in the Office of Health Planning at the Rhode Island Department of Health, Providence, Rhode Island.

The following is a description of the issues affecting trauma care nationally and in the state and the recommendations made by the Committee to address those issues at the state level.

The Status of Trauma Care Nationally

Trauma care, as we know it today, had its beginnings on the battlefields of Korea and Vietnam, where saving a patient's life depended on the readiness of the surgical team to begin operating as soon as the patient arrived at the hospital. Through the 1970s and early 1980s the specialty of trauma surgery evolved as the surgeon began applying combat zone approaches to saving the lives of seriously injured civilians. As of 1987, there were approximately 2896 trauma centers in the US, half of which had undergone a formal American College of Surgeons (ACS) or state certification review.[2]

At the present time two major problems plague trauma care to varying degrees across the country:[3]

1. *Lack of regional planning and maldistribution of trauma centers.* Many of the country's trauma centers operate alone and are not part of integrated

ABBREVIATIONS USED:

ACS: American College of Surgeons
BAC: Blood alcohol concentration
DWI: Driving while intoxicated
RIDH: Rhode Island Department of Health
RIH: Rhode Island Hospital

**Summary of ACS Standards for Level I Trauma Centers: In-house trauma surgeon, In-house anesthesiology, Optimal trauma patient care, Physical plant/staffing/equipment, Trauma quality assurance program, Trauma training programs, 600-1000 trauma patients per year. Trauma public education, Teaching program and Research.*[1]

regional systems. Two landmark studies performed in California between 1983 and 1984, demonstrated that integrated trauma systems save lives, ie, within a 3 to 4 year period trauma deaths were reduced fivefold to sevenfold as a result of the formation of "trauma systems" in Orange County and San Diego, California.[2]

A 1987 study of the status of regional trauma systems nationally found that (a) only two states (Maryland and Virginia) had the eight essential components of a regional trauma system, (b) 19 states and the District of Columbia had incomplete statewide coverage or lacked essential components (including Rhode Island) and (c) 29 states had yet to initiate the process of trauma center designation.[1]

In addition to a lack of regionalization, the maldistribution of centers negatively impacts trauma care nationally. Although some areas have a glut of facilities, other communities and hospitals are slow to establish them. The rule of thumb is that each trauma center should serve at least 350,000 people.[2] In Missouri there is one trauma center per 80,000 residents, in Washington DC there is one per 150,000 population and in Rhode Island there is one for approximately one million residents.[1]

2. *Financial Drain.* At the present time, the literature is inundated with stories of hospitals dropping out of the trauma care business and cities nationwide struggling to keep their trauma networks from totally collapsing. According to the University of Maryland's National Study for Trauma & Emergency Medical Systems, skyrocketing and uncompensated trauma care cost has been cited as the prime reason for closures of trauma centers. At least 670 centers in 11 states and Washington have been forced to close since 1985.[4] For example, 23 hospitals belonged to the Los Angeles County trauma network when it started in 1983. At the end of 1989, only nine hospitals remained in the network and each lost approximately $500,000 to $2 million annually on emergency care services.[5]

. . . skyrocketing and uncompensated trauma care cost has been cited as the prime reasons for closures of trauma centers.

In terms of federal support for system planning and development, President Bush signed into law HR 1602, "Trauma Care Systems Planning & Development Act of 1990".[6] This bill authorizes $60 million for states to establish regional trauma networks. Under the bill, states must develop trauma care plans and have them approved by the Secretary of Health and Human Services to qualify for funding.[7] Plans must incorporate national trauma care standards, designate which facilities can treat critically injured patients and identify how patients should be transferred when medically necessary.[8] States which have fully implemented their state trauma plans may apply for a waiver from the Secretary permitting grant monies to be used to reimburse designated trauma centers for a portion of their uncompensated trauma care expenditures. Unfortunately, there is no fiscal appropriation for the bill at this time.[6]

Impetus for Trauma System Planning in Rhode Island

In December 1988, Dr Peter Trafton, Surgeon-in-Charge, Division of Orthopaedic Trauma, Rhode Island Hospital (RIH), expressed concern to the Department of Health that there was a need for regional planning for the delivery of trauma care. In addition, with the financial problems facing RIH, eg, $18 million loss in 1988, Dr Trafton expressed concern that additional outside resources need to be identified in order to maintain and improve trauma care in our state. Subsequently, the Hospital's administrators indicated that the Trauma Center was a major financial drain on the hospital and that they were in the process of preparing a report detailing its cost-benefit. The administrators also indicated that they had no intention of closing the Trauma Center, but significant financial assistance, likely emanating from legislation, would be needed to maintain the Center's viability.[10] Dr Robert Woolard, Director of RIH's Emergency Department and, at the time, Medical Consultant to the Rhode Island Department of Health (RIDH), Division of Emergency Medical Service, indicated that the quality and accessibility of trauma care for Rhode Island and portions of southeastern Massachusetts is heavily dependent on the capacity of RIH to continue to provide trauma services. Dr Woolard estimated that the proportion of the state's trauma treated at RIH has been rapidly increasing over the past five years and that RIH currently sees the vast majority of the area's major trauma cases.[10]

Based on this input, in June 1989, H. Denman Scott, MD, Director of Health, directed the Office of Health Planning to develop a plan for trauma care in Rhode Island, focusing as a first priority on the viability of the Rhode Island Hospital Trauma

Table. TRAUMA SYSTEM PLANNING COMMITTEE

Members:

Charles A. Aldrich
Harmony Fire Department

Anthony Barile
RI Department of Human Services

Donald Morath, MD
Roger Williams General Hospital

Joseph Pfeifer, MD
Rhode Island Hospital

Lawrence A. Ross
Blue Cross/Blue Shield of RI

Steve Smith, MD
Newport Hospital

William J. Waters, Jr, PhD
Chair, RI Department of Health

A. Edward Azevedo
St. Joseph Memorial Hospital

John Hynes
Kent County Memorial Hospital

Robert G. Norton
Rhode Island Hospital

Robert Picard
RI Ambulance Board

Donna Sassi, RN, BSN, CEN
RI Emergency Nurses C.A.R.E.

Peter Trafton
Rhode Island Hospital

Robert Woolard
RI Department of Health

Rhode Island Department of Health Participants:

Jay Buechner, PhD
Office of Health Statistics

Russel Spaight
Office of Emergency Medical Services

Ann Thacher-Renshaw
Office of Injury Prevention Project

Robert Marshall, Jr, PhD
Office of Health Promotion

Mary Speare
Office of Community Alcohol
Abuse/Injury Project

Donald Williams
Office of Health Services Regulation

Committee Staff:

Catherine P. Millman, MBA
Office of Health Planning

Melinda L. Komiske
Office of Health Planning

Center. To accomplish this task, the Director of Health invited individuals representing the Trauma Center, Rhode Island Hospital, other hospitals, the emergency medical system, fire chiefs, and third party payers to participate in the Rhode Island Trauma System Planning Committee (see Table).

Trauma System Planning Committee Recommendations

The Trauma System Planning Committee made recommendations to the Director of Health in three major areas: (1) planning and development of the trauma system, (2) amelioration of the financial strain of providing Level I trauma care and (3) reduction in the occurrence of trauma in Rhode Island. The following describes the findings of the Committee in each area and the recommendations made, based on those findings.

Trauma System Planning and Development

The Committee strongly agreed that the size of the population in Rhode Island and the distance for a majority of the state's population to trauma centers in neighboring states, ie, New Haven, Worcester and Boston, makes it essential to maintain a Level I Trauma Center within the state. In addition, the Committee agreed that the Trauma Center provided a vital public service to the entire state, and therefore state support, to some degree, and general quality oversight of the Center could be justified.

To be certified as a Level I Trauma Center by the American College of Surgeons (ACS) a facility must meet the guidelines and standards set by ACS.[9] At the present time, the RIH Trauma Center and most others around the country are not in complete compliance with these standards. The most notable deficiency at RIH is the lack of a trauma registry.[10] As in most other states, there is no Rhode Island legislation requiring a trauma center to meet any standards for ACS certification and there is no requirement to conduct trauma system planning and development or to report on the cost-effectiveness of trauma care. There are regulations requiring the completion of a data sheet on each ambulance run which is submitted to the Department of Health; however, limited resources have prohibited analysis of rescue run sheet data in recent years.

The task force made the following recommendations:

- **A Level I Trauma Center should be maintained in Rhode Island.**
- **Legislation should be enacted for the purpose of building Rhode Island's capacity to plan for and further develop a statewide trauma system.** The State should provide funds for the development and maintenance of a trauma registry at the Rhode Island Hospital Trauma Center, to be eventually expanded to all hospitals in the state. In addition, the state should develop an emergency medical system plan with a

trauma system component, an information system for prehospital emergency care, a trauma center designation authority and a capacity for monitoring and disseminating trauma registry and prehospital emergency care reps to the public. The Committee suggested that funds to accomplish this recommendation be raised through an assessment on motor vehicle registration.

Financing Trauma Care

In 1987, the Department of Health estimated that 82,000 Rhode Islanders were without health insurance, and now that figure may have risen to as high as 125,000.[11,12] Of the uninsured population, 84% are estimated to be under 45 years of age, the age group most significantly impacted by trauma.[11] Specifically, of the 56.9 million persons injured nationally in 1985 almost one-third were in the 25-44 age group, and the second highest number of injuries, almost one-fifth, were in the 15-24 age group.[13] In addition, the leading cause of death for the age group under 45 is injury.[14]

The concentration of the medically uninsured in this age group coupled with the financial impact of trauma, make the delivery of trauma care particularly susceptible to the negative impact of uncompensated care. In 1989, RIH estimated that trauma patients accounted for $1.5 million in uncompensated care at the hospital. In order to provide Level I trauma services, Rhode Island Hospital incurs additional expenses not realized by other hospitals in the state. Similarly, physicians involved in the treatment of trauma patients are likely to experience a significant caseload which is not covered by insurance, eg, a Rhode Island Hospital physicians group, heavily involved in trauma care, estimated that they experienced $1 million in uncompensated care in 1988.[10]

> ***In 1987, the Department of Health estimated that 82,000 Rhode Islanders were without health insurance, and now that figure may have risen to as high as 125,000.***

The task force made the following further recommendations:

- **The number of Rhode Islanders with adequate trauma care coverage should be expanded.** In the long term, the Committee agreed that expanding health care coverage, including adequate coverage for trauma services, would be the most lasting solution to the financing of trauma care and would provide equitable access to the largest number of people.
- **A $1 million fund should be created to cover uncompensated trauma care provided at the Level I Trauma Center.** The Committee offered this recommendation as an interim solution to the expansion of health care coverage to the entire population as recommended above. This fund would serve as a payor or last resort after all other sources of health care coverage have been exhausted and would be used only for patients who require Level I trauma care and have moderate household incomes. It was suggested that funding for this program come from a tax related to use of motor vehicles and/or alcohol consumption.
- **All third party payers should recognize and adequately reimburse for the additional expense incurred in providing Level I trauma care.** The Committee agreed that third party payers, private and public, should take into account the additional expense of providing Level I trauma care when setting reimbursement levels.

Prevention of Trauma

A major requirement in any effort to reduce trauma morbidity and mortality and its related costs is the prevention of trauma. Many of the most severe trauma cases are a result of traffic accidents and many of these are alcohol related. To address this problem, the committee recommended legislation that would prevent the severity of injury in motor vehicle accidents and discourage individuals from driving while intoxicated.

Seat Belts: Rhode Island law only requires children up to and including age 12 to wear seat belts when traveling in passenger vehicles. Experts estimate that seat belts can reduce the risk of a fatality in a crash by 40 to 50%. It is estimated that approximately 1800 deaths per year could be prevented, if all 50 states had seat belt laws in place. Mandatory seat belt laws have been enacted in 34 states and the District of Columbia.[15]

A Rhode Island Hospital Trauma Center study of head injuries treated in 1988 found that 52 of the 131 most severe head injuries were the result of motor vehicle accidents. Of these 52 patients with motor vehicle accident related head injuries, only 3 were wearing seat belts.[16]

The Committee recommends the following:

- **Legislation should be enacted in Rhode Island mandating seat belt use by all motor vehicle drivers and occupants.**

Motorcycle Helmets: Rhode Island law only requires motorcycle passengers to wear helmets (drivers are not required to wear helmets). Between 1966-1976, most states had helmet laws in place, because of a federal law requiring states to lose a portion of their federal highway funds if they did not enact helmet laws. Repeal of this law in 1976 resulted in 26 states repealing or weakening their helmet use law. The result was a 44% increase in motorcycle fatalities nationally between 1976 and 1979. Presently, helmets are required in 46 states for some or all motorcyclists (23 states require helmets for drivers under a certain age, usually 18).[17]

A Rhode Island Hospital Trauma Center study of head injuries treated in 1988 found that 14 of the 131 most severe head injuries were the result of motorcycle accidents. Of these 14 patients with motorcycle related head injuries only 1 was wearing a helmet.[16]

The Committee recommends the following:

- **Legislation should be enacted in Rhode Island mandating that all motorcycle drivers and passengers wear approved helmets.**

Driving While Intoxicated: The current legal blood alcohol content (BAC) in Rhode Island is 0.10%. Alcohol is estimated to be involved in about half of all fatal crashes.[12] The "Surgeon General's Workshop on Drunk Driving" recommended that the US Congress pass legislation to encourage states to reduce the BAC level from its present legal level of 0.10% to 0.08% immediately and to 0.04% by the year 2000. The permissible BAC level for drivers under 21 years of age should be established at 0.00% nationally.[18]

Administrative summary suspension for both refusal to take a test and for a BAC higher than the level of intoxication tends to deter drunk driving by decreasing the time between offense and punishment and increasing the certainty of a penalty. The arresting police department issues the driver a receipt and forwards the seized license to the department of motor vehicles. The receipt acts as a temporary license until final action by the department of motor vehicles, either if the driver fails to request a hearing within a set number of days or after the agency rules against the driver at a hearing. Suspension of the license, when it occurs, takes effect after the hearing whether or not the driver appeals to the courts. Different lengths of suspension can be set to encourage testing, often 90 days for failing a test and 180 days for refusal.[19]

Based on the above, the Committee recommends the following:

- **Enact and enforce legislation reducing the legal BAC level from the present level of 0.10% to 0.08%. The permissible BAC level for drivers under 21 years of age should be established at 0.00%.**
- **Enact and enforce legislation for administrative summary suspension of the driver's license requiring the arresting police office to seize the license of a driver who either refuses a chemical test for alcohol or fails the test.**
- **Make blood alcohol concentration testing mandatory for all drivers involved in fatal and serious injury traffic collisions, both for data collection and prosecution, as appropriate.**
- **Encourage stricter enforcement of existing laws regarding "driving while intoxicated" (DWI) both by police and by the court system with the goal of convicting more intoxicated drivers of DWI.**

Future Direction

Trauma care is a vital link in Rhode Island's health care system. Attaining the goal of assuring access to cost-effective quality trauma care will be a challenge to us all, particularly in the troubling times we are experiencing throughout the health care system. The Rhode Island Trauma System Planning Committee has provided direction as to where efforts should be expended. Hopefully, in ensuing years, the implementation of their recommendations will be realized.

References

[1] West, John G. et al, "Trauma Systems: Current Status–Future Challenges," *JAMA*, June 24, 1988, 259:3597-3600.

[2] Zoler, Mitchel L., "Trauma Care" *Medical World News*, June 13, 1988, pp. 69-79.

[3] "Crisis in Trauma Care," *Medicine & Health: Perspectives*, August 29, 1988.

[4] "Feds Ante Up to Improve Trauma Care." *Medical World News*, June 11, 1990.

[5] Tokarski, Cathy. "Lawmakers Ponder Trauma Network Woes." *Modern Healthcare*, pp. 17-18, August 4, 1989.

[6] Gauthier, J. "Trauma Care Systems Planning & Development Act of 1990," *The EMS Leader*, Cornell Communications, Eau Claire, WI. 1990.

[7] Traumagram–Newsletter of the American Trauma Society," Vol. 15, No. 7: pp. 2-4, November/December 1990.

[8] Regional Trauma Network Bill Approved by Congress," *Modern Healthcare*, p. 13, November 5, 1990.

[9] American College of Surgeons, "Hospital and Prehospital Resources for Optimal Care of the Injured Patient and Appendices A through J," Chicago Illinois, February 1987.

[10] Office of Health Planning, Rhode Island Department of Health, "Trauma System Planning Committee Recommendations," January 1990.

[11] Office of Data Evaluation, Rhode Island Department of Health, "The Population without Health Insurance

In Rhode Island, 1987," Report prepared for the Health Care for all Conference, Smithfield, RI, May 1988.

[12] Campbell, MK and Buechner, JS, Office of Health Statistics, Rhode Island Department of Health, "Rhode Island's Health 1989: The Uninsured Population in Rhode Island," May 1990.

[13] Rice, DP, MacKenzie, EJ and Associates, *Cost of Injury in the United States: A Report to Congress*. San Francisco, CA: Institute for Health & Aging, University of California and Injury Prevention Center, Johns Hopkins University, 1989. p. 8.

[14] Waters, William J., Rhode Island Department of Health, Rhode Island Injury Prevention Program CDC Grant Application, June 15, 1989.

[15] Insurance Institute for Highway Safety, "Seat Belt Use Laws Trim Deaths and Injuries," Status Report vol. 22, No. 13, December 5, 1987.

[16] Joseph Pfeifer, MD (draft) "Rhode Island Hospital Trauma Center: Overview Report," September 1989.

[17] "The History of Motorcycle Helmet Laws in the USA," Injury Prevention Network Newsletter, Vol, 4, Nov. 3 & 4, Winter 1987-1988.

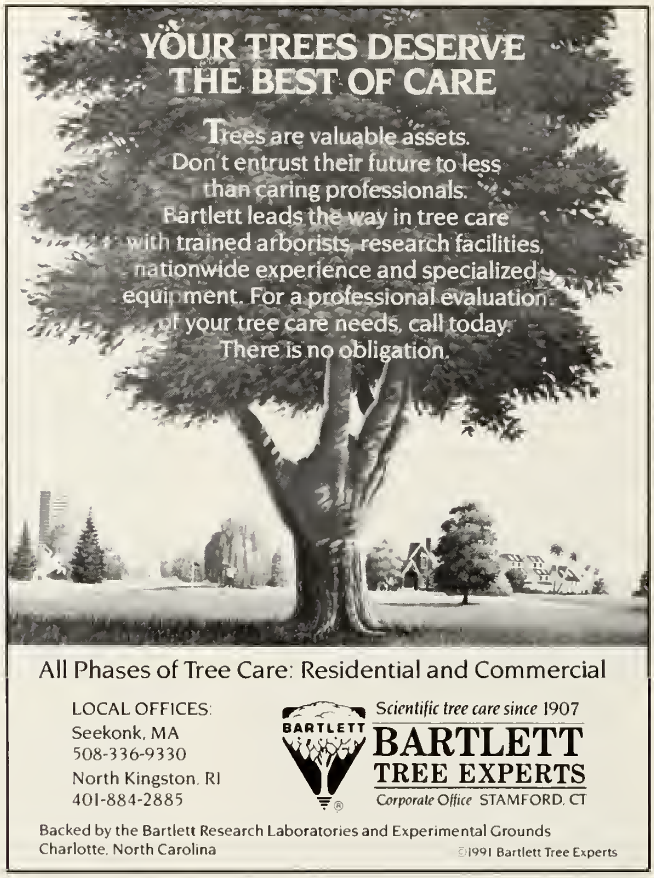
[18] US Department of Health & Human Services, "Surgeon General's Workshop on Drunk Driving: Proceedings," Washington, DC: December 14-16, 1988.

[19] National Highway Traffic and Safety Administration, US Department of Transportation, correspondence to Injury Prevention Program, Rhode Island Department of Health December 1990.

If you have a concern about
the competence, well-being, or
ethical judgment of a physician,
please write or call:

Rhode Island Medical Society
106 Francis Street
Providence, RI 02903
331-3207

RIMS' experienced peer review
committees on Competency,
Impairment, offer effective and
confidential help.



Trees are valuable assets. Don't entrust their future to less than caring professionals. Bartlett leads the way in tree care with trained arborists, research facilities, nationwide experience and specialized equipment. For a professional evaluation of your tree care needs, call today. There is no obligation.

All Phases of Tree Care: Residential and Commercial

LOCAL OFFICES:
Seekonk, MA
508-336-9330
North Kingston, RI
401-884-2885

Scientific tree care since 1907
BARTLETT
BARTLETT
TREE EXPERTS
Corporate Office STAMFORD, CT

Backed by the Bartlett Research Laboratories and Experimental Grounds
Charlotte, North Carolina

©1991 Bartlett Tree Experts

CHOICE SUITES
AVAILABLE
FOR LEASE

Attractive medical building,
X-ray facility, lab and private busy
emergency room available.

1150 Reservoir Avenue
Cranston, RI

946-2400
Ask for Donna Ladd

Prehospital Emergency Care in Rhode Island

Peter Leary, RN, EMT-C
Robert H. Woolard, MD, FACEP

The development of prehospital emergency services and the training of Emergency Medical Technicians (EMT) in Rhode Island, began in 1974.

Emergency physicians recognize that their ability to care for patients can be enhanced by the provision of care prior to arrival of the patient at the emergency department. Indeed, prehospital emergency care is a vital component of emergency medical practice. In many countries and several US cities emergency physicians provide prehospital care personally by staffing rescue vehicles. Prehospital emergency care is the treatment of patients by trained health care providers (Emergency Medical Technicians) in the home or field prior to arrival at the emergency department. The status of the present Rhode Island rescue system and the potential for future development of prehospital emergency care will be reviewed in this article.

Prehospital emergency medical services (EMS) developed in response to the need to establish transport, stabilization and resuscitative procedures for the victims of accidents and acute illnesses. Although some Rhode Island fire departments have long maintained rescue services to assist firemen at fires, prior to 1960 most victims of accidents and acute illnesses were carried to the hospital by their family, friends or hearses from the local mortuary. Well-meaning, but untrained personnel provided transport with, at best, a first aid kit at their disposal.

In the late 60s, the National Academy of Sciences and the American College of Surgeons' Committee on Trauma recognized the need for a major change. The increased morbidity and mortality associated with this rudimentary prehospital transport system was identified as a solvable problem. The development of prehospital emergency care from virtual nonexistence to a new public safety service in all communities in Rhode Island occurred over a 5 year period in the 1970s. The federal Emergency Medical Services Act (1973) and its subsequent revisions stimulated this

Peter Leary, RN, EMT-C, is Chief of the Division of Emergency Medical Services at the Rhode Island Department of Health. He is the former EMS Training Coordinator for the Department of Health, Providence, Rhode Island.

Robert H. Woolard, MD, FACEP, is Director of the Department of Emergency Medicine at Rhode Island Hospital and Brown University and medical consultant to the Division of Emergency Medical Services at the Rhode Island Department of Health, Providence, Rhode Island.

ABBREVIATIONS USED:

CPR: cardio-pulmonary resuscitation
DOT: Department of Transportation
EKG: electrocardiogram
EMS: Emergency Medical Services
EMT-A: Emergency Medical Technician, Ambulance
EMT-C: Emergency Medical Technician, Cardiac
EMT-D: Emergency Medical Technician, Defibrillation
EMT-I: Emergency Medical Technician, Intermediate
EMT-P: Emergency Medical Technician, Paramedic

phenomenal growth of prehospital emergency care. The development of prehospital emergency services and the training of Emergency Medical Technicians (EMT) in Rhode Island, began in 1974. The aim of this training and service was to improve stabilization and resuscitation in the field and during transport to the hospital. In Rhode Island, over 1.3 million dollars were received under the federal EMS Act grant programs.

One focus of the EMT training program was the provision of basic stabilization which needed immediate improvement. Toward this end, the US Department of Transportation provided guidelines for the curriculum of a new ambulance attendant, the EMT-A (Emergency Medical Technician-Ambulance).[1] The aim was to give EMT-As the knowledge base and skills necessary to "prevent further harm" to a victim of an accident or severe illness during transport from scene to hospital.

The current Rhode Island EMT-A curriculum entails a course that is 119 hours long.[2] The course trains students in cardiopulmonary resuscitation, rescue scene control, patient assessment, basic airway management, ventilation, oxygen administration, insertion of the esophageal obturator airway, pressure control of bleeding, bandaging, splinting, recognition of shock, and application of the pneumatic anti-shock trousers. There is immediate treatment of several conditions such as poisoning (with ipecac), shock, chest pain in a suspected cardiac patient and respiratory distress (with oxygen) and anaphylaxis (with subcutaneous epinephrine). The EMT-A is also trained to provide obstetrical assistance, function at the scene of a mass casualty and utilize extrication technic to remove victims from damaged vehicles safely and expeditiously. Finally the EMT-A is made aware of precautions necessary for infection control and procedures for safe ambulance operation.

The EMT-A is also trained to provide obstetrical assistance, function at the scene of a mass casualty and utilize extrication technics to remove victims from damaged vehicles safely and expeditiously.

With the acquisition of this basic knowledge and these skills, the EMT-A should be able to professionally administer appropriate prehospital emergency care for a large number of routine emergency cases at the scene and during transport. No intravenous fluid or advanced medical therapy is given by the EMT-A. Although the EMT-A has certain fundamental skills such as the use of antishock trousers and the esophageal obturator airway, advanced lifesaving skills such as endotracheal intubation, circothyrotomy or pleural decompression by needle thorocostomy are available only at a higher level of EMT training. An innovative program EMT-A defibrillation training or EMT-D has been undertaken voluntarily in many Rhode Island communities. The American Heart Association has emphasized early defibrillation in the treatment of a cardiac arrest followed by CPR.[3] This training program is currently 12 hours long. There are 449 EMTs trained in defibrillation and 30 prehospital service providers covered.

The Department of Transportation recognized the need for a more advanced level of prehospital care and developed the curriculum for the EMT-Paramedic (EMT-P) training program.[4] The EMT-P, as envisioned by DOT, would be a physician extender, the "eyes and ears of the physician" in the field. The standard EMT-P training curriculum requires a minimum of 450 hours after completion of EMT-A training, however, an estimated 700-1000 hours of instruction is usually necessary to bring the student to full EMT-P competency. The course includes training on the EMT-P role in the health care system, legislation, ethics, death and dying, basic anatomy, physiology, medical terminology, history, physical examination, information transfer, fluid and electrolyte therapy, pharmacology of 20-30 medications, respiratory pathophysiology, dysrhythmia recognition, EKG monitoring, defibrillation, phlebotomy, intravenous line insertion, carotid sinus massage, external pacemaker placement, central nervous system pathophysiology, approach to coma, seizures and spinal injury, advanced soft tissue injury management, diabetes, anaphylaxis, environmental exposure, substance abuse, poisoning, geriatric illness, normal delivery, care of the newborn, complications, of labor and delivery, pediatric medical and traumatic emergencies, pediatric endotracheal intubation and intravenous line insertion, telemetry and radio communication.

The EMT-P . . . would be a physician extender, the "eyes and ears of the physician" in the field.

Paramedic training was designed to create a prehospital professional who could be directed to treat emergencies in the field and extend emergency care directed from the hospital to the patient. Paramedic training involved spending the majority of training time in the hospital environment gaining assessment skills under the direction of physicians and nurses in the Emergency Department as well as the Coronary Care Unit, pediatric ward, etc. The first RI paramedic training program is currently scheduled for commencement in September 1991. It is based on a curriculum developed at the Rhode Island Department of Health to train Rhode Island EMT-Cs or Cardiacs to the paramedic level.[5] The course is directed by Dr Thomas Lemke and John Plaikas and will be hosted by The Memorial Hospital of Rhode Island. Most EMT-P training programs are time intensive both for trainees and trainers, and hence expensive. Many EMT-P training programs have expanded the required hours to as many as 2000 to insure adequate preparation of a competent physician extender. The paramedic has been recognized as an allied health professional in several states and often holds an associate degree from a community college. There is a national registry for paramedics which provides certification.

Most states, including Rhode Island, implemented intermediate levels of training between the EMT-A and the EMT-P levels. These levels of training were less costly and addressed specific needs within the incipient rescue service systems. These intermediate classifications developed around the acquisition of single skills or combinations of advanced skills such as intravenous line insertion, defibrillation and/or endotracheal intubation. At least 30 different intermediate levels exist in the United States.[6] In many rescue systems these intermediate EMTs assist paramedics in delivering advanced rescue service. In some systems the intermediate EMT provides selected advanced skills within basic rescue services.

In Rhode Island, an intermediate level, the EMT-Cardiac became the top training level. EMT-Cs assume responsibility for the provision of advanced rescue skills in most Rhode Island communities. The Rhode Island EMT-C is trained for 170 hours beyond the EMT-A (290 total training hours). The Rhode Island EMT-C curriculum is based on a reduction in the classroom training established by the Department of Transportation for the EMT-P and elimination of hospital-based clinical training.[7]

The initial aim of EMT-C training was to allow advanced 673 EMT-Cs. All 39 Rhode Island communities now have active rescue services. . .

The initial aim of EMT-C training was to allow advanced cardiac resuscitation in the field in response to a cardiac arrest. Full training in the assessment and treatment of other major emergency conditions was not undertaken in the initial EMT-C curriculum. Over the years the course has been expanded considerably to broaden the scope of EMT-C prehospital training and practice. The EMT-C Training Program is conducted under the auspices of the American Heart Association. The course includes training in advanced patient assessment skills, fluid and electrolyte therapy, pharmacology of 15 medications, cardiac and respiratory pathophysiology, dysrhythmia recognition, EKG monitoring, defibrillation, phlebotomy, intravenous line insertion, approach to a variety of medical illnesses, telemetry and radio communication. A newly revised EMT-C curriculum due to commence in September 1991 will add further emphasis to assessment skills and modern concepts of trauma care.

At present, the life-saving skill of endotracheal intubation is not part of the EMT-C curriculum. Endotracheal intubation training is offered to EMT-Cs as an extended role skill certification. This 8 hour training program is highlighted by a surgical suite rotation whereby intubations are performed by EMTs under the supervision of a physician anesthesiologist. Eight hospital facilities in Rhode Island have participated as clinical training sites for endotracheal intubation training. There are 142 EMT-Cs trained in endotracheal intubation and 26 prehospital service providers represented.

Rhode Island currently has 2,931 EMTs with 1,582 EMT-As and 673 EMT-Cs. 630 EMTs are licensed at a lower intermediate level (EMT-I). Skills previously attained at only this lower intermediate level (EMT-I) are not standard to all training programs at the EMT-A level. The number of EMT-Is will gradually diminish by attrition or advancement to EMT-C or EMT-P training levels. The EMT-I level is being phased out. 46 EMT-Ps are licensed as Rhode Island prehospital care providers and perform at the paramedic level within a paramedic service or EMT-C level within other advanced rescue groups. All 39 Rhode Island communities now have active rescue services organized through the community fire service for the most part.

There are 192 licensed rescue vehicles; 55 as advanced life support units; 118 as basic units. 19 are licensed as reserve units. Of the 87 ambulance services 37 are at the advanced service level with EMT-C staff available 24 hours each day and 50 are at the basic service level.[8] Two services have paramedics available 24 hours each day (Cumberland and Bristol).

According to the Rules and Regulations Relating to Emergency Medical Services (R23-4.1-EMS), the Division of Emergency Medical Services of the Rhode Island Department of Health is the regulatory agency responsible for the statewide supervision of ambulance and rescue services and the coordination of prehospital emergency medical care. The Department of Health on advice from the Ambulance Service Advisory Board establishes the minimum standards in the areas of licensing, vehicles, equipment or vehicles, personnel, training, communications, inter-facility and service cooperation and the treatment of acutely ill or injured by ambulance and rescue personnel. Presently, the Division of Emergency Medical Services consists of a Chief, a field inspector, an administrative assistant and a secretary.

Given the population base and geography of Rhode Island, a sufficient number of personnel and vehicles are available to provide timely rescue service. Average response times from call for help to arrival of basic rescue are close to ideal (4-5 minutes) in nearly all Rhode Island metropolitan and suburban communities. Ongoing efforts are being made to reduce transport times from rural communities through use of two-tiered response systems, air ambulance service and mutual assistance pacts.

Further improvement in EMS service may very well extend from prehospital research projects currently underway in Rhode Island. In cooperation with Rhode Island Hospital, several prehospital care providers are participating in two clinical studies regarding thrombolytic therapy and the prehospital administration of higher doses of epinephrine to cardiac arrest patients.

A third project is anticipated involving the use of a 12 lead EKG to diagnose acute myocardial infarction in the field. The Rhode Island Department of Health is currently developing standards and procedures for the implementation of automated external defibrillation treatment at a first responder level. A paramedic training course will be underway soon. These measures and others may continue to enhance the quality of prehospital medical services provided in Rhode Island.

References

[1] Department of Transportation EMT-A – Emergency Medical Technician-Ambulance: National Standard Curriculum, USDOT, NHTSA, DOT, HS 900015 March 1984.

[2] Rhode Island EMT-A Curriculum Guidelines, Rhode Island Department of Health, published January, 1991.

[3] Textbook of Advanced Cardiac Life Support, 2nd Edition, American Heart Association, 1987, National Center, Dallas, TX.

[4] Department of Transportation EMT-P – Emergency Medical Technician-Paramedic: National Standard Curriculum, USDOT, NHTSA, DOT HS 900088 August 1986.

[5] Division of Emergency Medical Services, "EMT-C to P conversion curriculum".

[6] 1991 Buyer's Guide Emergency Medical Services, Vol. 15, No. 9, September 1990.

[7] Rhode Island EMT-C Curriculum Guidelines, Rhode Island Department of Health, published January 1988.

[8] Division of Emergency Medical Services, Annual Report 1990, Rhode Island Department of Health, Internal Document, January 1990.

HAYFEBROL™

allergy-relief formula
Sugar-Free

For fast relief of nasal and sinus congestion, sneezing, itchy and watery eyes due to hayfever and other allergic conditions. Can be used for sodium and sugar-restricted diets.

1-800-638-SCOT
1-401-942-8555

If not available in your area, order direct.

Scot-Tussin
Pharmacal Co., Inc.
Cranston, RI 02920-0217

For Rx only:
Tussirex SF, 10 mg.
Codeine/5 ml.
Alcohol-Free
Natural Coloring

HAYFEBROL™
allergy relief formula
Sugar-Free

For fast relief of nasal and sinus congestion, sneezing, itchy and watery eyes and other respiratory allergies of the common cold or sinusitis. Can be used for sodium restricted diets.

FOR CHILDREN AND ADULTS

Alcohol-Free
Sodium-Free
Dye-Free

4 FL. OZ. (120 ml)

Immobilization of Skeletal Injuries

Peter G. Trafton, MD, FACS

Eighty percent of severely injured trauma center patients return to full-time work, and repay society many times over for the cost of their care and the system that made it possible.

Injuries are the most important public health problem in America, because of the personal, social, and economic cost resulting from premature death and disability. Prevention of injuries is so cost-effective that it is not only an essential element of public policy but a vital part of both public health and preventive medicine. Once an individual is seriously injured, an effective trauma system, a component of a regional Emergency Medical Service (EMS), offers the best chance for survival and rehabilitation. Eighty percent of severely injured trauma center patients return to full-time work, and repay society many times over for the cost of their care and the system that made it possible.

Pre-hospital care is an essential part of any trauma system. The patient-directed components of such a system are the following: 1) Access to care, 2) prehospital care, 3) hospital care, and 4) rehabilitation. It is generally agreed that trauma patients should be transported rapidly, without elaborate or lengthy resuscitation in the field, to the nearest *appropriate* hospital. Time is of the essence because so many of the treatable, life-threatening lesions of trauma require urgent surgery. Pre-hospital resuscitation should generally be limited to airway establishment, control of bleeding, and immobilization of the cervical spine and fractures. En route to the hospital, large bore IV catheters should be inserted for volume resuscitation.

In a comparatively small area like Rhode Island, travel time can be minimized. However extrication may delay the process. So also may life-saving procedures (intubation, chest tube insertion, IV access, etc.) that require a stop at a local hospital because EMTs at the scene lack the necessary training, experience, or equipment. In either situation, helicopter ambulances, staffed with nurses and paramedics with advanced life support skills, may significantly improve our system and are recognized by pre-hospital care protocols of the Rhode Island Ambulance Service Coordinating Board, though not necessarily by our present insurance carriers.

Pre-hospital care providers must be experts in recognizing patients with potentially severe injuries and in their safe, rapid transportation. In addition to control of airway and bleeding, this involves maneuvering and transferring patients, and applying several types of splints. Manuals and training courses offer this information.[1,2] Unfor-

ABBREVIATIONS USED:

CSM: circulation, sensation, movement
EMS: Emergency Medical Services
ICU: Intensive Care Unit
IV: intravenous
MAST: Military Anti-Shock Trouser
PASG: Pneumatic Anti-Shock Garment

Peter G. Trafton, MD, FACS, is Surgeon-in-Charge, Division of Trauma, Department of Orthopaedic Surgery at Rhode Island Hospital and Associate Professor, Department of Orthopaedics at Brown University, Providence, Rhode Island.

tunately, Rhode Island, like many areas, has a high turn-over of EMTs, a large percentage of whom are volunteers. Training funds and staff are limited. The result is a worrisome shortage of properly prepared emergency medical personnel. No matter how well executed the hospital and rehabilitation phases, a patient with less than optimal prehospital care is at a disadvantage that may compromise outcome.

> ***Unfortunately, Rhode Island, like many areas, has a high turn-over of EMTs, a large percentage of whom are volunteers.***

Persuasive evidence of the importance of prehospital care is offered by Tscheren et al.[3] Specially trained physicians now accompany most German ambulances. They are experts at airway maintenance, volume resuscitation, and fracture stabilization. Rapid response and minimal delay at the scene are emphasized. Patients so transported had lower mortality rates, and briefer ICU stays. Wound infections occurred in 3.5% of open fractures with splinting by physicians, instead of the 12% noted in those transported by ambulances without physicians. Prompt realignment and effective splinting of open fractures included application of a sterile dressing that was kept in place until the patient was in the operating room.

Injuries produce tissue damage, with both local and systemic consequences. Movement of an injured body region is not only painful, but increases both the amount of local damage and also the systemic consequences. A classic example of the deleterious effects of moving an injured part is an unstable cervical spine fracture in an initially neurologically normal patient. Bending or twisting the neck may crush the spinal cord, producing a complete cord injury. Another example is that of a fractured femoral shaft. Adequate initial splinting incorporating both in-line traction and longitudinal mechanical support decreases bleeding and extravascular fluid accumulation, decreases the risk of respiratory failure, and decreases mortality. These points have been proven many times, especially in military conflicts. During the WW II siege of Tobruk, soldiers with femoral fractures were evacuated successfully after application of a traction Thomas splint which was then wrapped with plaster of paris for additional support of the injured limb.

Unstable wounds are not only sponges that soak up intravascular volume, but they release debris and inflammatory mediators with deleterious effects on distant organs. Fat embolism, gut origin septic state, and multiple organ failure syndrome are the results. Effective field immobilization, and prompt comprehensive surgical fracture stabilization in the hospital, decrease mortality and morbidity, most probably because they prevent the just-mentioned pathological mechanisms. While this discussion focuses on prehospital immobilization of skeletal injuries, it is important to recognize the highly significant, recently identified contribution to the care of the seriously injured by very early surgical stabilization of the long bones and pelvis.[4]

Immobilization of an injured part is achieved by one of three mechanisms: 1) traction, 2) encirclement, and 3) attachment to a splint.

1) In-line traction produces alignment and stability through soft tissue tension, in the same way a taut rope is rigid. Manual in-line traction, provided by the hands of a trained and experienced EMT, gains temporary stability for moving the patient, correcting deformity, or applying a splint for extrication and transportation. Excessive force may be harmful, especially if it over-elongates a very unstable injury, or is maintained for too long a time. Skin traction (eg, anklet and windlass of a femoral traction splint) can be tolerated satisfactorily for the usually brief period of prehospital care.

2) Encirclement of the injured limb with a more or less rigid cushion also provides stability. Pillow or pneumatic splints are common examples of encirclement splints. Potentially constricting, they offer uniform, adjustable pressure, which may provide mechanical support and also control bleeding. However, as seen with the pneumatic antishock garment (PASG), excessive pressure can produce additional tissue trauma. A pneumatic splint must be inflated only enough to provide comfort and stability. Increasing pain may indicate ischemia.

3) Attachable splints limit motion by sharing their rigidity with the injured part by means of straps, bandages, or tape that hold the injured part to the splint. A familiar example is the ubiquitous IV splint, to which a patient's wrist is attached during intravenous therapy. A major hazard of such splints is their potential for excessive focal pressure on bony prominences, and for using tight, tourniquet-like bandages. Any rigid, board-like device can be used as an attachable splint. Padded wire ladder splints, or padded plaster slabs, held in place with cloth bandages, work in a similar fashion. Most commonly, for

prehospital patients with potentially serious injuries, one sees use of a long spine board, perhaps in conjunction with a vest-type extrication device or "shortboard". A number of more or less sophisticated spine boards exist. Mere application of such a device does not ensure adequate and safe immobilization. Training and practice are crucial for reliable use of any splint, but especially so when the spine must be immobilized during extrication of a patient from an awkward and/or hazardous environment.

The essential elements of immobilization of an injured part or patient are 1) recognition of need for immobilization, 2) choosing the appropriate splint, 3) applying it in a way that causes no additional harm, and 4) monitoring to ensure that it safely supports the limb or patient. These elements will be reviewed for typical immobilization scenarios involving the spine and extremities.

In most situations, splinting requires temporary manual support prior to application of the splint for transportation. *Traction in Position* is the first phase. Gentle, steady traction is applied manually to the distal part of the injured limb, which is slowly and smoothly restored to a normal alignment with the more proximal part. *Hands-on stability* is next provided by the splinting team, who use their hands for manual in-line immobilization to maintain alignment of the body parts, using gentle traction as needed. Finally *splint stability* is provided by applying an external device which replaces the hands of the caregivers.

Monitoring sees not only to the mechanical stability of the splint, but also to the clinical condition of patient and injured part. Are airway, breathing, and circulation maintained? Does the injured part have intact circulation (pulses), sensation, and movement ("CSM")? Is a change in limb status due to deterioration of the initial condition, or to some effect of the splint?

Cervical Spine

Unstable spine injuries are not outwardly obvious. If not immobilized, irreversible cord injury may be produced during rescue or subsequent treatment. Indications of possible cervical spine instability are 1) any injury above the clavicles, 2) unconsciousness, 3) multiple injuries, 4) high-velocity crash or fall, or 5) neck pain.

Splints for the cervical spine must maintain an anatomic position of head and neck relative to the trunk. Various types of cervical collars are commonly used for splinting the neck. However, it is essential to recognize that *by themselves such collars cannot adequately immobilize the cervical spine.* Therefore it is essential that a collar not be trusted as more than a warning device. Actual immobilization of the spine requires a splint attached securely to both head and thorax. For the neck, this can begin with a vest-type extrication device or short extrication board.[5,6] Since such a splint does not also protect the thoraco-lumbar spine, which may also be injured, it is generally used alone only during extrication, and then supplemented with a long spine board, to which head and trunk can both be secured. Initial cervical spine immobilization can be provided with manual in-line positioning, with direct transfer to the long board for splint stability. While traction may improve reduction, it is not required for transportation of patients with spine injuries.[7] Details of cervical immobilization are well covered in standard references.[1,2,8,9] It is important to realize that the usual spine board is minimally padded. Thus it risks pressure sores on bony prominences if the unconscious and/or hypotensive patient is left on it longer than needed.

Thoraco-lumbar spine and pelvis

Adequate immobilization of the entire spine and pelvis is provided by proper application of a long spine board. A more adaptable alternative, permitting easier and perhaps safer transfer is the scoop stretcher.

Pneumatic Anti-Shock Garment

The pneumatic antishock garment (PASG) or military antishock trouser, (MAST) is a pressurizable "suit" that is readily applied to the lower extremities and abdominal region of an injured patient. It has been advocated as an emergency treatment for hypovolemic shock, and is a quick means of splinting lower extremity and especially pelvic injuries. The PASG is controversial as a means of maintaining blood pressure in an urban environment with relatively short transportation times. It increases systolic pressure by increasing peripheral vascular resistance and myocardial afterload. It may also reduce intra-abdominal hemorrhage. It does not reliably increase perfusion of vital organs and has convincingly been associated with compartment syndrome and limb loss when applied for more than brief periods to injured extremities of patients in shock. The PASG can be life-saving in patients exsanguinating from unstable pelvic fractures, and may be of greater value when long transportation times are involved. However, its dangers must be remembered, and rapid, definitive resuscitation with early removal of the PASG is imperative. Contraindications include pulmonary edema, diaphragmatic rupture, left ventricular dysfunction, and bleeding outside the confines of the device. It is vital that the PASG not delay volume resuscitation, or rapid transportation, especially for penetrating trauma. The divide is inflated only enough to stabilize blood pressure. Its removal must await volume replacement, and be carried out gradually with careful monitoring. If inflation of the abdominal segment of the PASG causes respiratory distress, this part must be deflated immediately, and diaphragmatic rupture assumed toxic until it is excluded.

. . . by themselves . . . collars cannot adequately immobilize the cervical spine. Therefore it is essential that a collar not be trusted as more than a warning device.

Application of the PASG is carried out by spreading out the garment on a long spine board. The board and PASG are carefully slid under the patient while spine alignment is maintained. Next the garment legs are applied to the patient's and then the abdominal portion is applied and secured. After checking vital signs to reconfirm need, the legs are reinflated first, and then the abdomen. The device is inflated only enough to restore blood pressure and perfusion to an acceptable level. 20 to 25mm Hg pressure provides splinting and venous tamponade. An automatic pop-off valve limit is applied pressure. If no hemodynamic response occurs within 30 minutes of valve activation, one can conclude that there is no beneficial effect. Gradual pressure reduction and PASG removal is appropriate in such a case.

PASG removal requires establishment of large bore intravenous access, cardiac and blood pressure monitoring, and an available surgical team. Gradual deflation is begun, abdominal segment first, but stopped for additional fluid administration if pressure falls more than 5 mm Hg. A precipitous fall in blood pressure is an indication for reinflation of the PASG until more fluid is given or hemorrhage can be controlled surgically. Early removal of the device from injured lower extremities may be necessary to avoid limb loss.[8]

Hip dislocation

Because of pain and resistance to repositioning the typically deformed leg of a patient with a traumatic hip dislocation, such injuries must be splinted in the position of deformity, using padding to support the limb, is then strapped or taped to the long spine board.

Femoral fractures

While hip fractures can usually be immobilized satisfactorily by securing the legs together and to the spine board or more padded stretcher, traction improves their stability. It is an essential element of splinting femoral shaft fractures, for which traction splints should be universally available in EMS ambulances and hospital emergency departments. Such commercially available devices can readily be applied, following standard protocols.[1,2] Once on, they provide comfort, and reduce tissue trauma and bleeding.

Knee, Leg, Foot and Ankle Injuries

More proximal leg injuries (knee, upper tibia, etc.) can be adequately immobilized with a femoral traction splint, but one must avoid constriction, and pay special attention to using only enough traction to obtain support without distraction or causing pain. For more distal injuries, a wire ladder or other prefabricated splint, *always* applied over adequate padding, or a pneumatic splint, inflated only enough to obtain support, is more appropriate.

Upper Extremity Injuries

Shoulder region injuries can usually be splinted adequately by securing the arm to the chest, using padding and tape or other bandages as needed. The elbow is best splinted in a position of moderated flexion 30 to 60 degrees, and not forced into a painful position, because of the possibility of an injury that might restrict motion, and/or neurovascular compromise caused by stretching vital structures over fracture fragments. More distal injuries, as in the lower extremity, are readily splinted with padded prefabricated, or pneumatic splints.

Adequate immobilization, rapidly and safely applied, minimizes additional trauma and improves comfort and recovery of the injured patient.

Especially if definitive treatment will be delayed, moderate elevation of the injured part, 6 to 12 inches above heart level, will improve venous return, and help control swelling.

Conclusions

Techniques and equipment for immobilization of skeletal injuries are well developed and readily available. Adequate immobilization, rapidly and safely applied, minimizes additional trauma and improves comfort and recovery of the injured patient. It is essential that EMTs, and indeed all who care for the injured, be able to immobilize properly the injured spine and extremities.

References

[1] *Emergency Care and Transportation of the Sick and Injured.* American Academy of Orthopaedic Surgeons, 1987.

[2] *Pre-hospital Trauma Life Support,* 2nd Edition, Basic and Advanced, Prehospital Trauma Life Support Committee of the National Association of Emergency Medical Technicians, 1990.

[3] Tscherne H, Kalb PM, Wisner DH. Pre-hospital care of the polytrauma patient: the role of the physician. Chap 16, p 295 in Border JR, Allgower M, Hansen ST Jr, Ruedi TP, eds. *Blunt Multiple Trauma* Marcel Dekker NY & Basel 1990.

[4] Border JR et al, *Ibid,* Chap. 5.

[5] Graziano AF, Scheidel EA, Cline JR, and Baer LJ: A Radiographic Comparison of Prehospital Cervical Immobilization Methods. Annals of Emergency Medicine 16:1127-1131, 1987.

[6] Cline JR, Scheidel E, and Bigsby, EF: A Comparison of Methods of Cervical Immobilization Used in Patient Extrication and Transport. J Trauma 25:649-653, 1985.

[7] Burney RE, Waggoner R, and Maynard FM: Stabilization of Spinal Injury for Early Transfer. The Journal of Trauma 29: 1497-1499, 1989.

[8] *Advanced Trauma Life Support Manual,* Committee on Trauma, American College of Surgeons, 1988.

PHYSICIAN
Internal Medicine/
Family Practice

4 Hours a Week

We are seeking a physician who is
interested in part time practice.
In exchange for 4 hours of
physician time, we will provide
an office, exam room and receptionist.

Please Call
Suzanne McCarthy
Clinical Programs Ltd.

273-2950

HOSPICE CARE
OF RHODE ISLAND, INC.

"A Special Kind of Caring"

A licensed hospice providing a 24 hour
day program of home care to terminally ill
patients and their families.

Physician inquiries and referrals are welcome

You will remain the primary physician
and interact with our medical directors and staff.
Hospice Care of Rhode Island offers a full team
approach, pain managementand symptom control
and is Hospice Medicare certified.

PROVIDENCE
800 BUTLER DRIVE – 272-4900

ISLAND HOSPICE
51 TOURO STREET – 846-3599

WASHINGTON COUNTY
118 POINT JUDITH ROAD – 789-5200

THE NEW JERSEY AND FLORIDA MEDICAL ASSOCIATION TRUSTS
(CoreStates Bank, Trustee)

* V.E.B.A. PLAN

FEATURES

UNLIMITED TAX DEDUCTIBLE CONTRIBUTIONS

REGARDLESS OF YOUR PENSION SITUATION

AND

IS NOW OPEN TO DOCTORS IN OTHER STATES

EVEN IF . . .

- YOUR PENSION PLAN IS OVER FUNDED
- YOUR PENSION PLAN IS MAXIMUM FUNDED
- YOU HAVE NO PENSION PLAN

*VOLUNTARY EMPLOYEE BENEFITS ASSOCIATION

PLEASE SEND ME A copy of the I.R.S. "Favorable Letter of Determination" and other relevant information on your *V.E.B.A. Plan

NAME____

ADDRESS______________________________________

DATE OF BIRTH__________________ TELEPHONE # (____) ________________

Mail to:

THE KIRWAN COMPANIES
402 MIDDLETOWN BLVD., SUITE 202
LANGHORNE, PA 19047

(609) 778-4388 .... (215) 750-7616 .... FAX (215) 750-7791

QUESTION:

WHAT ARE THE THREE MOST
IMPORTANT THINGS TO
CONSIDER WHEN CHOOSING
AN INSURANCE AGENCY?

ANSWER:

EXPERIENCE, EXPERIENCE,
EXPERIENCE

INSURANCE SINCE 1879

STARKWEATHER & SHEPLEY INC. - (401) 421-6900

Morton Smith, Inc. - (401) 861-6800

155 South Main Street
Providence, Rhode Island 02903

YOCON®

YOHIMBINE HCl

Description: Yohimbine is a 3a-15a-20B-17a-hydroxy Yohimbine-16a-carboxylic acid methyl ester. The alkaloid is found in Rubaceae and related trees. Also in Rauwolfia Serpentina (L) Benth. Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine. It is a crystalline powder, odorless. Each compressed tablet contains (1/12 gr.) 5.4 mg of Yohimbine Hydrochloride.

Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalmic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it; however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympathicolytic and mydriatric. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly must not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.[1,2] Also dizziness, headache, skin flushing reported when used orally.[1,3]

Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.[1,3,4] 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.[3]

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

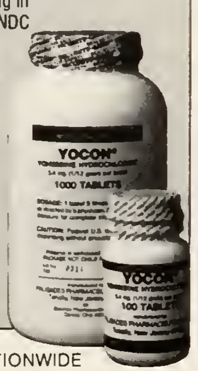
References:

1. A. Morales et al., New England Journal of Medicine: 1221. November 12, 1981.
2. Goodman, Gilman — The Pharmacological basis of Therapeutics 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. Weekly Urological Clinical letter, 27:2, July 4, 1983.
4. A. Morales et al., The Journal of Urology 128: 45-47, 1982.

Rev. 1/85

AVAILABLE AT PHARMACIES NATIONWIDE

PALISADES PHARMACEUTICALS, INC.
219 County Road
Tenafly, New Jersey 07670
(201) 569-8502
1-800-237-9083



AXID® (nizatidine capsules)

Brief Summary. Consult the package insert for complete prescribing information.
Indications and Usage: 1. *Active duodenal ulcer*—for up to 8 weeks of treatment. Most patients heal within 4 weeks.

2. *Maintenance therapy*—for healed duodenal ulcer patients at a reduced dosage of 150 mg h.s. The consequences of therapy with Axid for longer than 1 year are not known

Contraindications: Known hypersensitivity to the drug. Because cross sensitivity in this class of compounds has been observed, H_2-receptor antagonists, including Axid, should not be administered to patients with a history of hypersensitivity to other H_2-receptor antagonists

Precautions: *General*—1. Symptomatic response to nizatidine therapy does not preclude the presence of gastric malignancy

2. Dosage should be reduced in patients with moderate to severe renal insufficiency

3. In patients with normal renal function and uncomplicated hepatic dysfunction, the disposition of nizatidine is similar to that in normal subjects

Laboratory Tests—False-positive tests for urobilinogen with Multistix® may occur during therapy

Drug Interactions—No interactions have been observed with theophylline, chlordiazepoxide, lorazepam, lidocaine, phenytoin, and warfarin. Axid does not inhibit the cytochrome P-450 enzyme system; therefore, drug interactions mediated by inhibition of hepatic metabolism are not expected to occur. In patients given very high doses (3,900 mg) of aspirin daily, increased serum salicylate levels were seen when nizatidine, 150 mg b.i.d., was administered concurrently

Carcinogenesis, Mutagenesis, Impairment of Fertility—A 2-year oral carcinogenicity study in rats with doses as high as 500 mg/kg/day (about 80 times the recommended daily therapeutic dose) showed no evidence of a carcinogenic effect. There was a dose-related increase in the density of enterochromaffin-like (ECL) cells in the gastric oxyntic mucosa. In a 2-year study in mice, there was no evidence of a carcinogenic effect in male mice, although hyperplastic nodules of the liver were increased in the high-dose males as compared with placebo. Female mice given the high dose of Axid (2,000 mg/kg/day, about 330 times the human dose) showed marginally statistically significant increases in hepatic carcinoma and hepatic nodular hyperplasia with no numerical increase seen in any of the other dose groups. The rate of hepatic carcinoma in the high-dose animals was within the historical control limits seen for the strain of mice used. The female mice were given a dose larger than the maximum tolerated dose, as indicated by excessive (30%) weight decrement as compared with concurrent controls and evidence of mild liver injury (transaminase elevations). The occurrence of a marginal finding at high dose only in animals given an excessive and somewhat hepatotoxic dose, with no evidence of a carcinogenic effect in rats, male mice, and female mice (given up to 360 mg/kg/day, about 60 times the human dose), and a negative mutagenicity battery are not considered evidence of a carcinogenic potential for Axid

Axid was not mutagenic in a battery of tests performed to evaluate its potential genetic toxicity, including bacterial mutation tests, unscheduled DNA synthesis, sister chromatid exchange, mouse lymphoma assay, chromosome aberration tests, and a micronucleus test.

In a 2-generation, perinatal and postnatal fertility study in rats, doses of nizatidine up to 650 mg/kg/day produced no adverse effects on the reproductive performance of parental animals or their progeny

Pregnancy—Teratogenic Effects—Pregnancy Category C—Oral reproduction studies in rats at doses up to 300 times the human dose and in Dutch Belted rabbits at doses up to 55 times the human dose revealed no evidence of impaired fertility or teratogenic effect; but, at a dose equivalent to 300 times the human dose, treated rabbits had abortions, decreased number of live fetuses, and depressed fetal weights. On intravenous administration to pregnant New Zealand White rabbits, nizatidine at 20 mg/kg produced cardiac enlargement, coarctation of the aortic arch, and cutaneous edema in 1 fetus, and at 50 mg/kg, it produced ventricular anomaly, distended abdomen, spina bifida, hydrocephaly, and enlarged heart in 1 fetus. There are, however, no adequate and well-controlled studies in pregnant women. It is also not known whether nizatidine can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Nizatidine should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers—Studies in lactating women have shown that 0.1% of an oral dose is secreted in human milk in proportion to plasma concentrations. Because of growth depression in pups reared by treated lactating rats, a decision should be made whether to discontinue nursing or the drug, taking into account the importance of the drug to the mother

Pediatric Use—Safety and effectiveness in children have not been established

Use in Elderly Patients—Healing rates in elderly patients were similar to those in younger age groups as were the rates of adverse events and laboratory test abnormalities. Age alone may not be an important factor in the disposition of nizatidine. Elderly patients may have reduced renal function.

Adverse Reactions: Clinical trials of varying durations included almost 5,000 patients. Among the more common adverse events in domestic placebo-controlled trials of over 1,900 nizatidine patients and over 1,300 on placebo, sweating (1% vs 0.2%), urticaria (0.5% vs <0.01%), and somnolence (2.4% vs 1.3%) were significantly more common with nizatidine. It was not possible to determine whether a variety of less common events were due to the drug

Hepatic—Hepatocellular injury (elevated liver enzyme tests or alkaline phosphatase) possibly or probably related to nizatidine occurred in some patients. In some cases, there was marked elevation (>500 IU/L) in SGOT or SGPT and, in a single instance, SGPT was >2,000 IU/L. The incidence of elevated liver enzymes overall and elevations of up to 3 times the upper limit of normal, however, did not significantly differ from that in placebo patients. All abnormalities were reversible after discontinuation of Axid. Since market introduction, hepatitis and jaundice have been reported. Rare cases of cholestatic or mixed hepatocellular and cholestatic injury with jaundice have been reported with reversal of the abnormalities after discontinuation of Axid

Cardiovascular—In clinical pharmacology studies, short episodes of asymptomatic ventricular tachycardia occurred in 2 individuals administered Axid and in 3 untreated subjects.

CNS—Rare cases of reversible mental confusion have been reported.

Endocrine—Clinical pharmacology studies and controlled clinical trials showed no evidence of antiandrogenic activity due to nizatidine. Impotence and decreased libido were reported with equal frequency by patients on nizatidine and those on placebo. Gynecomastia has been reported rarely

Hematologic—Fatal thrombocytopenia was reported in a patient treated with nizatidine and another H_2-receptor antagonist. This patient had previously experienced thrombocytopenia while taking other drugs. Rare cases of thrombocytopenic purpura have been reported

Integumental—Sweating and urticaria were reported significantly more frequently in nizatidine- than in placebo-treated patients. Rash and exfoliative dermatitis were also reported

Hypersensitivity—As with other H_2-receptor antagonists, rare cases of anaphylaxis following nizatidine administration have been reported. Rare episodes of hypersensitivity reactions (eg, bronchospasm, laryngeal edema, rash, and eosinophilia) have been reported

Other—Hyperuricemia unassociated with gout or nephrolithiasis was reported. Eosinophilia, fever, and nausea related to nizatidine have been reported.

Overdosage. Overdoses of Axid have been reported rarely. If overdosage occurs, activated charcoal, emesis, or lavage should be considered along with clinical monitoring and supportive therapy. Renal dialysis does not substantially increase clearance of nizatidine due to its large volume of distribution.

PV 2091 AMP
[091190]

References

1. Data on file, Lilly Research Laboratories
2. *Scand J Gastroenterol* 1987;22(suppl 136):61-70
3. *Scand J Gastroenterol* 1987;22(suppl 136):47-55
4. *Am J Gastroenterol* 1989;84:769-774

NZ-2943-B-149347

Additional information available to the profession on request.

Lilly

Eli Lilly and Company
Indianapolis, Indiana
46285

For excellent response in the treatment of duodenal ulcers...

AXID® nizatidine

has the right answers

- Rapid epigastric pain relief[1,2*]
- Fast and effective ulcer healing[2,3,4]

AXID

PASSES THE ACID TEST

*Most patients experience pain relief with the first dose.

See adjacent page for references and brief summary of prescribing information.

NZ-2943-B-149347

© 1991, ELI LILLY AND COMPANY

A View From Another System – The Alabama Experience

Ronald A. Shaw, MD

All EMS systems have common basic components, since these were mandated by the original federal legislation in the early 1970s.

Prehospital care exhibits striking differences among the several states and territories, despite the common objective of reducing morbidity and mortality prior to the patient's arrival at a health care facility. These differences extend to all facets of prehospital emergency care systems, and are mandated by variations in local medical practice, in addition to economic, political, and geographic factors. Having recently relocated to Rhode Island from Alabama affords me the opportunity to examine two state systems. Such a comparison will enable the reader to evaluate the merits of effective prehospital care from a local perspective, and to recognize the importance of physician participation in this critical component of the health care system.

Structure

All EMS systems have common basic components, since these were mandated by the original federal legislation in the early 1970s. As the funds from Washington faded away, those agencies providing EMS diversified and a local flavor was added during this evolutionary process. Despite this diversification, the basic relationship of the prehospital care system to the physician has persisted. The system provides medical care through technical support usually in the absence of an on-scene physician. Advanced Life Support units, being the most sophisticated, transfer certain physician assessment and management skills directly to the scene either by physician-approved protocols or direct voice contact. In either case, comprehensive medical direction remains the cornerstone of any effective EMS operation.

Beyond this basic premise, there are many types of system structure. In Alabama, unlike Rhode Island, many are hospital-based; this is especially prevalent in rural settings for two reasons. First, the low tax base in such settings in the rural South precludes the establishment of comprehensive public services which form the basis for many EMS systems. Second, the network of small hospitals which evolved as a consequence of the Hill-Burton Act furnishes technical personnel who apportion their time between in-hospital and prehospital duties. This duality of function decreases costs, as both clinical and administrative resources are shared.

The urban and suburban areas in Alabama are most frequently served by the county/municipality-based system, of which there are several types. The most prevalent form is that based upon the Fire Service. Since the vehicles and personnel of the Fire Services are geographically positioned and available 24 hours per day, they are a natural substrate for an

ABBREVIATIONS USED:

ALS: Advanced Life Support
BLS: Basic Life Support
EMS: Emergency Medical Service

Ronald A. Shaw, MD, is Assistant Physician, Department of Emergency Medicine at Rhode Island Hospital, Medical Director and Consultant at Rhode Island Department of Health and Editorial Reviewer for the Annals of Emergency Medicine.

EMS system. At first reluctant to establish an entity which would divert attention from the primary role of fire suppression, most Fire Chiefs have found that EMS calls constitute the majority of runs and have enhanced funding for personnel and equipment.

> ***. . . most Fire Chiefs have found that EMS calls constitute the majority of runs and have enhanced funding for personnel and equipment.***

In the majority of cases in Alabama, the Fire Department rescue vehicles provide on-scene care only, with transport being provided by a separate private ambulance. By contrast, most of the rescue units in Rhode Island serve a dual function of both providing care on the scene and transportation of the patient. Although this would seem preferable by eliminating the need for a separate ambulance, it results in significant intervals of unit down-time consequent to the round-trip to the hospital. This may pose a particular difficulty for semi-rural volunteer services, whose limited number of vehicles may result in an entire community being temporarily deprived of rescue presence as the unit is inaccessible during transport.

Legislation

Legislation serves as the enabling framework of the EMS system. Originally a consequence of Federal law in the early 1970s, each state developed EMS legislation in order to comply with Department of Health, Education, and Welfare (now HHS) requirements, as well as those of the Department of Transportation. During the ensuing years, these original legislative acts have been amended and/or rewritten as political, economic, and patient care considerations have evolved. In addition, authority and responsibility statutes have been modified as subsequent litigation has disclosed problems in the initial laws and regulations.[1]

All EMS laws provide for some central agency which has overall responsibility for the system on a statewide basis. In both Alabama and Rhode Island, this authority has been given to the Department of Health. In its original format, authority in Alabama was granted additionally to six regional agencies, which would have jurisdiction in EMS matters in a particular group of counties. Many other states abandoned the regional concept when the federal block grants expired, since the EMS regions and the Health Service Agency boundaries were identical. The various laws encompass many aspects of EMS service, including ambulance specifications, personnel training and qualifications, and Medical Control, in addition to providing the administrative structure.

Funding

Of course, no discussion of legislation would be complete without mentioning funding. Originally, this was provided by the Section 1202 and 1203 Federal grants, but this program was not renewed by the Congress, and was left to the states to provide the monies to fund EMS.[2] Consequently, many strategies have evolved, varying widely among the states. Maryland and Pennsylvania are of a handful of states which have funded and supported statewide EMS systems as a total concept, mainly from the general funds. Alabama has no comprehensive legislation, and funds its State EMS Division from cigarette taxes, being the only state to utilize this source. Rhode Island, in addition to Florida, Arizona, Utah, and Mississippi, provides the funds using revenues from motor vehicle violations.[3] Third-party reimbursement from EMS, as that for medical care in general, varies widely among the states. In the northeast, with many urban poor among the served population, such revenues are almost non-existent. Alabama has a similar problem with its rural poverty, combined with a lack of a mandated medical coverage requirement for automobile insurance. This is in contrast to Minnesota, which has such a strict ordinance that some trauma centers and EMS systems actually post annual revenue surpluses.

Technician Levels

Another area of variation is that of EMS provider levels. Despite certain training minimums prescribed by the Department of Transportation for various levels, many states have evolved hybrids in order to accommodate local conditions. In all systems, there is a basic level of rescue personnel, which is rudimentary, and involves basic first aid, splinting, airway management, eye irrigation, administration of ipecac syrup, oxygen administration, etc. This is usually given the appellation BLS, or Basic Life Support, after the American Heart Association designation. Following the same format, the higher level is called Advanced Life Support, which involves invasive airway maneuvers, administration of intravenous medications, more sophisticated diagnostics, and central vein cannulation, to name a few. It is at this higher level of care in which the physician is involved directly in the prehospital environment.

Since nothing in life is so simple, there are many other levels of involvement among the various states. In Alabama as in Rhode Island, there are first responders; these are individuals with no medical training, such as volunteers, police officers, civic groups, who basically provide enhanced first aid.[4] In Alabama, there is an additional level called intermediate, now abandoned in many locales. These technicians are BLS personnel who are also trained in IV access, pneumatic antishock garment application, automatic defibrillation, and endotracheal intubation; however, they cannot administer IV medications. In Rhode Island, we have a unique level called the Cardiac, which is an ALS technician able to provide all but the most invasive procedures. This would be the equivalent of the Paramedic level in Alabama. Additionally, Rhode Island has a Paramedic level, which includes all the procedures performed by the Cardiac plus central vein cannulation, cricothyroidotomy, decompression of tension pneumothorax, etc. If the reader is confused, your physician colleagues in California must deal with *five* different levels of EMS personnel, with licensure by individual counties.

Access

The next logical step is to consider the manner in which the patient care is executed. This begins with access and dispatch. Of prime importance is public awareness, since the most refined system is useless if the public does not know how or when to call. Many papers have been written about the Seattle system, with its widespread CPR training and all the cardiac arrest victims saved. Thoughtful students of EMS systems aver that the success is not due to bystander-initiated CPR, rather that the public is more inclined to access the EMS system immediately as the result of such training, saving precious seconds. Another device that has saved time is the 911 number, which has greatly simplified access. The latest version, Enhanced 911, provides direct source location data from the point of call, so that prehospital units may be dispatched even when the calling party is unaware of their location.

> ***. . . most of the rescue units in Rhode Island serve a dual function of both providing care on the scene and transportation of the patient.***

Subsequently, the response must be properly dispatched. Once the call has been transmitted from 911, the individual service dispatcher must evaluate the call, and send the proper unit or units in response. In Rhode Island, this is often simple since most fire services provide both Basic and Advanced Life Support utilizing the same vehicles. This is also the case in rural Alabama; however, many suburban and most municipal services use a tiered response, providing BLS from a fire truck and a second ALS crew in a Paramedic truck. This requires the dispatcher to formulate a judgment so that the proper vehicle can be sent. Such a variable response requires additional training for dispatchers, utilizing a protocol approach based upon the patient's chief complaint. Several training programs have evolved nationally to meet this need, and many fire departments in Alabama and elsewhere send their training officer to such national symposia to acquire these symptom-based protocols and develop local applications.[5]

Medical Control

Since the heart of any EMS system is the provision of medical care, the physician must be intimately involved. This participation and responsibility of the physician in the EMS process is referred to as Medical Control. Although not a new concept, it has evolved to a more comprehensive status since its inception. The earliest form of Medical Control is the direct type which involves direct physician participation on the scene. This was common in the United States until the early 1960s, when interns and residents were no longer required to ride on ambulances. Although this is still the case in many countries, direct physician participation in this country is limited to staffing air ambulances and to riding on rescue trucks as a rotation in emergency medicine residency training programs.

> ***Since the heart of any EMS system is the provision of medical care, the physician must be intimately involved.***

Indirectly, physicians participate in on-line and off-line Medical Control. The former involves direct ordering of medications and treatments via phone or radio communication with field units; the latter is comprised of administrative functions such as protocol development, retrospective run reviews, quality assurance, training standards, and risk management.[6] Many physicians involved in this process are specialists in emergency medicine; however, internists, surgeons, and even neurologists have active roles in managing EMS systems around the country. The most important qualification is a desire to become involved, rather than specific training. In general, any physician-participant should have a thorough familiarity with the operation of the rescue, have first-hand knowledge of base station communications, participate in the training of EMS technicians, and be thoroughly familiar with hospital emergency department operations. Those who do not regularly treat critically ill cases must be certified in Advanced Cardiac Life Support (American Heart Assoc) and Advanced Trauma Life Support (American College of Surg), available to all physicians nationwide.

> ***The ultimate test of the EMS system in general and Medical Control in particular is its effect on morbidity and mortality in various disease processes.***

The structural aspects of Medical Control vary in different locales. In Alabama, the administrative responsibility rests with the medical director in each of the six regional agencies; they meet quarterly as the state Medical Control Committee to set overall policy and procedure, to ensure statewide uniformity. Each of the regions, in turn, have a committee with similar function, with the addition of activities such as hospital categorization and boundary determinations which require local specificity. By contrast, the small size of Rhode Island would make such a structure redundant, so most administrative Medical Control functions are assumed by the Division of EMS at the Department of Health, utilizing a physician consultant. As in Alabama, the Division relies on an Ambulance Service Advisory Board to review all Medical Control protocols and guidelines, since its membership is comprised of physicians, fire chiefs, and EMS administrators. The organizations which these individuals represent are designated by state law and were selected consequent to their relevance to EMS operations.

Quality Assurance

Finally, the ultimate test of the EMS system in general and Medical Control in particular is its effect on morbidity and mortality in various disease processes. The recent fiscal crises found in many states have prompted a detailed examination of the cost-benefit ratios of all public services, and EMS is no exception. In addition, quality assurance and risk management, terms so prevalent in the modern hospital, have assumed greater significance in the prehospital arena as well.[7] Subsequently, outcome audits of EMS functions have become an essential Medical Control function. In this endeavor, Alabama and Rhode Island, as many other states, are quite similar – they have practically no data. There is much information on process, such as numbers of EMTs, ambulance equipment, etc., but few data exist as to outcome of care. Until recently, there was no method to review run reports, since these forms were handwritten and did not lend themselves to meaningful analysis. Fortunately, both Alabama and Rhode Island are in the process of initiating optically-scanned run reports. This will enable the Division of EMS to collate thousands of entries and analyze trends. Additional specifics obtained by correlating the prehospital care data with inpatient outcomes will facilitate analysis of the effectiveness of EMS procedures in various diagnostic categories. This will enable EMS planners in both states to update protocols and methods, resulting in optimal utilization of scarce fiscal resources.

Conclusion

This brief comparison of Emergency Medical Services in two states has been attempted in order to enhance the knowledge of physicians whose regular practice is not directly in the field of emergency medicine. With this information, it is hoped that this improved awareness of EMS will lead to a realistic assessment of the system's strengths and weaknesses. Hopefully, this will also motivate the physician to augment his or her participation in this area.

References

[1] Public Law 93-154. Emergency Medical Services Systems Act of 1973.

[2] Boyd, DR: The History of Emergency Medical Services in the United States of America. In Boyd, DR, Edlich, RF, Micik (eds): Systems Approach to Emergency Medical Care. Norwalk, Appleton Century Crofts, 1983.

[3] State Survey. Emergency Medical Services 1986; 15(10): 167-189.

[4] Thompson, RG, Hallstrom, AP, Cobb, LA: Bystander-initiated Cardiopulmonary Resuscitation in the Management of Ventricular Fibrillation. Annals Intern Med 1979; 90: 737-740.

[5] Slovis, C: A Priority Dispatch System for Emergency Medical Services. Annals Emerg Med 1985; 14:43-48.

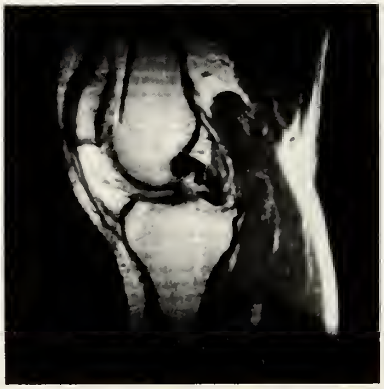
[6] Holroyd, BR, Kaopp, R, Kallsen, G: Medical Control, Quality Assurance in Prehospital Care. JAMA 1986; 256: 1027-1031.

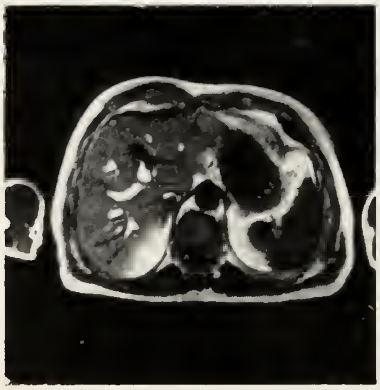
[7] Ryan, J: Quality Assurance in Emergency Medical Services. In Kuehl, S (ed): EMS Medical Directors' Handbook. St. Louis, CV Mosby, 1989.

RI-MASS MRI, P.C. is pleased to sponsor

the

2ND WEDNESDAY LECTURE SERIES





WHEN: The 2nd Wednesday
of each month
6:30 p.m. - 7:30 p.m.

WHERE: Marriott Hotel
Charles at Orms
Providence, RI 02904

LECTURES WILL RESUME ON WEDNESDAY, SEPTEMBER 11, 1991

"Oncological Applications of MRI in the Abdomen and Pelvis"

TO REGISTER/CALL: 1 (800) 848-9661

Emergency Medical Residency Training and EMS: The Beginning of the Future

Daniel L. Savitt, MD

As of February, 1991, there are eighty-five residencies (in emergency medicine) nationwide.

Physicians and prehospital care personnel interface most intimately within the Emergency Department, the facility through which the field providers receive both on-line and off-line direction of their actions. The physicians in the Emergency Department take over where the Emergency Medical Services (EMS) personnel leave off. The physician component of this relationship has evolved as much as the prehospital care system over the past half century. At their earliest times both were primitive entities. Community hospital emergency or accident rooms were frequently staffed by a hodgepodge of physicians, few of whom had completed their training, and none of whom had received the specialty training of a residency in emergency medicine. In University teaching facilities, supervision on a twenty-four hour basis by an attending physician was unheard of. Similarly the earliest ambulance services were run by funeral homes in many parts of the country. The EMS personnel had no formal training and their only plan of action was "load and go". Retrospectively, this level of care, though well meaning, was clearly a detriment to patients experiencing critical and life-threatening illness. Both arms of the emergency care system have evolved into sophisticated providers of patient care during recent decades. A critical appraisal at this point in time will reveal multiple facets of continuing evolution.[1] This article will explore the evolution of emergency medicine residency training as it relates to prehospital care and comment on the role of this specialty in the future evolution of EMS.

Daniel L. Savitt, MD, is Assistant Clinical Professor of Surgery at Brown University and Attending Physician with the Department of Emergency Medicine at Rhode Island Hospital, Providence, Rhode Island.

Historical Perspective

Residency training in emergency medicine developed almost simultaneously in Los Angeles at the USC/LAC medical center and in the University of Cincinnati Hospital in the early 1970s. In July, 1971, there were four positions offered between these two sites.[2] Since that time there has been a steady progression in the development of residencies. As of February, 1991, there are eighty-five residencies nationwide. New England has lagged far behind other portions of the United States in developing residencies. Currently there are only two in this region, one at the University of Massachusetts, Worcester, and another at Boston City Hospital. Several others are in developmental stages. A program proposal has been developed in Rhode Island called the Brown University Residency Training Program in Emergency Medicine. This program is centered at Rhode Island Hospital, has clinical and non-clinical rotations at the other Brown-affiliated hospitals and expects to have eight residents per year for a four-year training period.

ABBREVIATIONS USED:

EMS: Emergency Medical Service
USC/LAC: University of Southern California/ Los Angeles County Medical Center

This program is currently under review by the Residency Review Committee for Emergency Medicine and with favorable review will begin in July, 1992.

A program proposal has been developed in Rhode Island called the Brown University Residency Training Program in Emergency Medicine. This program is centered at Rhode Island Hospital.

Emergency medicine as a specialty has had considerable growth over the same time period. All of the original leaders in the field came from other established specialties. Virtually every branch of medicine and surgery has made its contributions. Initially, emergency physicians were defined by the environment of their practice. In 1976 the American Board of Emergency Medicine was formed and in 1979 application was made before the American Board of Medical Specialties for primary board status. This status was achieved in September, 1989. Currently the board administers a two-part certification examination to residency graduates yearly and requires recertification after a period of ten years. Despite this impressive development and organization of the specialty, availability of residency trained and/or board-certified emergency physicians lags far behind the number of available positions. This shortage is particularly marked in New England.

The EMS Curriculum of Emergency Medicine

Many emergency medicine training programs are intimately involved with the prehospital care systems and provide total support for the system. Others are only involved in the minute to minute interactions with the EMS system which gains its control elsewhere. The most comprehensive approaches form the best model for discussion.

The minimum that should be expected from any curriculum is that graduates of the Emergency Medicine training program understand the mechanics of the EMS system in a global sense and gain facility in the minute to minute interactions with EMS required of an emergency physician providing on-line medical control by telecommunication.[3] The specific qualifications of medical control physicians have been published by the American College of Emergency Physicians and are usually met as part of the emergency medicine residency training curriculum.[4] One common approach has been to design a minicourse in telemetry medical control. A typical course deals with equipment, review of protocols, communication skills, and review of simulated and real cases.[5] The importance of this aspect of emergency physician training is underlined by the frequent inclusion of telemetry-based cases in the emergency medicine oral board examination.

A further aspect of prehospital care education lies in the specific problems of practicing medicine in the field. Many residencies include field experience where the physicians in training ride with rescue personnel and either observe or participate in both patient care and radio communication from the field perspective.

The recent popularity of aeromedical transport has been a fertile field for resident education since most of these programs originate in emergency departments with residencies.[6] I can personally attest to the value of this experience having flown by helicopter to many accident scenes during my residency. Physicians whose training includes this experience have a great advantage in understanding the difficulties in field management of critical patients and are much more versatile when giving medical control.

Many emergency medicine training programs are intimately involved with the prehospital care systems and provide total support for the system.

Many physicians other than emergency physicians will have an opportunity to interface with the EMS system to improve patient care via off-line medical control, research and protocol development. Several examples are contained in this issue. The bulk of medical control and prehospital patient management falls within the responsibility of emergency physicians. Most training programs include specific rotations dealing with EMS administration so that a graduate can effectively interact with or even help develop prehospital care at a level above telemetry medical control. The curriculum of the Brown University emergency medicine residency is not unique in providing a month-long rotation in EMS administration with specific goals, experiences, and literature. This curriculum provides for the development of competence in on-line medical control though a base station course. There is opportunity to develop administrative skill through exposure to the components of the EMS system and the mechanisms utilized to develop, fund, and control such a system. The residents will actively participate in the education and training of EMTs and paramedics through didactic programs. They will participate in quality control audits of various field activities. The residents will develop an understanding of the spectrum of care delivered in the prehospital setting, and the roles of the various organizations involved such as the Health Department, Fire Departments, and ambulance services. Residents will also receive training in the management of disasters and hazardous materials accidents. In order to bring all of these detached and somewhat theoretical aspects together with reality the residents will spend time riding on ambulances and experiencing prehospital care first hand. These experiences will serve to form the basis of the future emergency physician's daily interaction with EMS.

The intimate relationship between EMS and Emergency Medicine has provided a fertile ground for progress through research. Little of what was and is practiced in prehospital care has any scientific base. Some of the practices are time honored and some are empiric. A good case in point was the routine application of Military Antishock Trousers to hypotensive patients. Careful prospective trials of this device have demonstrated its lack of utility and even potential detriment in certain circumstances.[7] The literature of emergency medicine, surgery, and medicine are replete with examples of productive research that has improved prehospital patient care. There is even an entire journal devoted to prehospital care.[8] This field of research is extremely active within emergency medicine and promises only to add to the sophistication and benefits of EMS.

The Impact on EMS

Providing trained emergency physicians well-versed in all aspects of prehospital care from the difficulties of field airway management to telemetry medical control to federal legislation – is a key objective of emergency medicine residency training. These individuals can serve as the focus for development of EMS into the sophisticated and effective patient care service that model systems across the country have demonstrated is possible. They provide knowledgeable medical control by means of telemetry. They are able to administer the systems they interact with effectively. They are able to stimulate progress through research. Perhaps the most crucial aspect of contribution, however, will lie within the educational process itself.

> ***Providing trained emergency physicians well-versed in all aspects of prehospital care – from the difficulties of field airway management to telemetry medical control to federal legislation – is a key objective of emergency medicine residency training.***

The training of prehospital care personnel is carried out in a variety of modes across the country. Much of the medical material is contributed by emergency physicians. Physicians involved in local EMS can serve a vital role in continuing education for the EMS personnel by reviewing runs, giving lectures, and serving as medical advisors of various units. Emergency physicians in Rhode Island have taken a lead in this process and the development of a residency program will serve to heighten this commitment.

The Future

The future for emergency medicine within New England holds only promise. Increased recognition of the specialty nationally and locally has spurred demand for residency trained physicians. Rhode Island may soon be the site of a new residency program and others are planned at several academic centers in the region. The presence of more emergency physicians will allow greater interface with EMS and guide its maturation within the region. EMS personnel perform a vital role within the community. Residency training in emergency medicine will only serve to increase the local quality of care.

References

[1] Johnson JC: Prehospital care: the future of emergency medical services. Ann Emerg Med, 1991, 20:426-430.

[2] Anderson GV: Where we've been, where we are, and where we're going: emergency medicine – past, present, and future. Ann Emerg Med, 1988, 17:982-989.

[3] Swor RA, Chishoim C, Krohmer J: Model curriculum in emergency medical services for emergency medicine residencies, Ann Emerg Med, 1989, 18:418-421.

[4] Emergency Medical Services Committee: Medical Control of Emergency Medical Services; An Overview for Emergency Physicians, American College of Emergency Physicians, Dallas, 1984.

[5] Storer D, Ashbrock S, Wexler H, et al: Emergency Physician Telemetry Course, Department of Emergency Medicine, University of Cincinnati, Cincinnati, 1979.

[6] Carter, G and O'Brien D: The impact of aeromedical helicopter programs on emergency medicine resident training; resident attitudes, perceived risks and benefits. J Emerg Med, 1986, 4:471-476.

[7] Bickell WH, Pepe PE, Bailey ML, et al: Randomized trial of pneumatic Antishock garments in the prehospital management of penetrating abdominal injuries. Ann Emerg Med, 1987, 16:653-658.

[8] Prehospital and Disaster Medicine, Jems Publishing Co., Carlsbad, CA.

Are your investments as successful as you are?

*I*f your hard work and success have allowed you to build a portfolio of $250,000 or more, we'd like to work with you.

[*Professionally Managed Investments*]

Because at Citizens Bank, our Trust and Investment Management team can provide you with the exceptional service, experience, and performance that will help you get the most from your investments. You'll have an account administrator who will act as your personal financial advisor and you'll be backed by a team of investment managers with a history of proven investment success.

To put us to work for you call Malcolm Starr at 456-7445. Because there's never been a better time for Citizens.

Trust and Investment Management Services

CITIZENS BANK

Citizens Trust Company/Citizens Savings Bank

Disaster Management: Problems and Solutions

Bruce Becker, MD, MPH, FACEP

> ***As are the generations of leaves, so are the generations of men. The Iliad.***

In spite of great efforts by scientists and physicians who work in the field of disaster, little progress has been made in prevention or intervention. Morbidity and mortality remain unacceptably large.[1] The following paper elaborates twelve of the major problems that impede the success of disaster management efforts and suggests some solutions to these problems. The NDMS system and DMATs will be discussed and the preparations of this system for the reception of Gulf War casualties used as an illustrative example.

Definitions

When is an emergency a disaster?

There are numerous definitions of disaster proposed.[1-5] They contain many common threads. Disasters are anthropocentric. A disaster must involve humans and their civilization. There must be morbidity and/or mortality (or a strong anticipation of these). The morbidity and/or mortality must be of a relatively large scale; nevertheless, "relatively large" is dependent upon the size and resources of the population that are afflicted. Disasters are generally sudden and unexpected. Most importantly, they overwhelm the capabilities of the available emergency medical and other rescue services. Disasters require the intervention of extraordinary agencies and manpower to save human life and restore the pre-disaster community equilibrium.

The definition of disaster is subjective. Some cases are obvious (the Mexico City earthquake)[6] but others are more complex. A two car accident with seven victims in rural Kentucky may be a disaster. A larger accident on the Southeast Expressway in Boston is a daily occurrence. The Air Florida crash into the Potomac in 1982[4] was clearly a disaster. Recently a plane crashed in Colorado Springs. All the passengers were instantly killed; the plane crashed into an empty park at night. No local structures or residents were involved. Was that a disaster or a tragedy?

Rigid definitions have no place. The very process of defining disaster can serve as a metaphor for all other aspects of disaster planning and relief. The definition must be flexible, adapting to unpredictable circumstances and local conditions, rapidly applicable by local authorities and easily redefinable as the situation changes. The classic phases of disaster: Pre-impact, Impact,

ABBREVIATIONS USED:

COPD: Chronic obstructive pulmonary disease
CISD: Critical Incident Stress Debriefing
DMAT: Disaster Medical Assistance Team
EMT: Emergency Medical Technician
ICS: Incident Command System
NDMS: National Disaster Medical System

Bruce Becker, MD, MPH, FACEP, is Attending Physician with the Department of Emergency Medicine at Rhode Island Hospital, Assistant Physician with the Department of Medicine at Rhode Island Hospital and Assistant Professor with the Department of Community Health at Brown University, Providence, Rhode Island.

Intervention, and Normalization are neatly delineated in textbooks but are of limited utility in the field. Consider the following disasters.

When Mt. St. Helens exploded there was a great deal of immediate morbidity and mortality[7,8] necessitating search and rescue, evacuation, triage, and acute medical intervention. Clearly, this was a disaster. Over the next few weeks there was an exacerbation of asthma and COPD in populations living within 100 square miles of the eruption (due to ash) requiring Emergency Department visits and hospitalizations. Over the next few months, environmental effects interfered with weather and crop production in several contiguous states affecting adversely the lives of hundreds of thousands of people. Dam projects in the Amazon River Basin have directly resulted in extensive malaria epidemics. The War in the Persian Gulf has resulted in an unknown but large number of immediate deaths along with civil unrest and environmental damage that will wreak unimaginable havoc on human populations. Which of these are disasters? What are the phases? The inter-phase boundaries?

Some disasters will always be self-evident, but many others will be declared and thus defined by community leaders based on their perceptions of the situation at the time that it occurs.

Low Probability Events

Prediction and preparation

Disasters are low probability events for the average citizen of the United States. It is 100,000 times more likely that a person will die in a motor vehicle accident (based on person years of exposure)[2] than that he will be killed by a disaster. Therefore, it is not surprising that people are unwilling to expend any effort on preparation for disasters.

Decisions made by utility-maximizing individuals devolve from an appreciation of net perceived benefit, and these decisions, especially in the areas of health and safety, are always made at the margins (ie, additional cost) of a single behavior (buckling a seat belt, foregoing a drink or cigarette, looking for the exits on a plane, or reading a disaster plan) subtracted from the perceived additional benefit.

It required more than 20 years for most states to pass mandatory seat belt laws; therefore it is surprising that individuals and their collective voice in government invest any time, money, or other resources in disaster preparation and planning efforts. The perceived marginal benefit is small.[2,6]

The most successful times for disaster planners and trainers are during and immediately after a disaster in an area. The impact is still fresh in the minds of the citizenry. A corollary to this notion is that the most successful preparatory efforts address disaster situations which are relatively frequent in a region (ie, earthquake preparation in San Francisco, hurricane preparation in Florida).

> ***The most successful times for disaster planners and trainers are during and immediately after a disaster in an area.***

Fear increases the apparent marginal benefit; moreover, memory and experience with a type of disaster can provide excellent motivation.[9] Calculating and publicizing the preparedness and vulnerability of communities using recently developed tools[10] may also improve planning compliance.

Prediction can be prophylactic, both by averting severe consequences, and, in the case of certain man-made disasters, obviating the disaster itself.[11-13] Nevertheless, prediction is always based on probability. Nonstatisticians' appreciation of probabilities is generally poor. A 10-15% likelihood of hurricane damage may trigger an evacuation recommendation from a regional emergency manager, but citizens who consider this to be a low probability are unlikely to respond with zeal.

Disaster Plans

Boring, tedious, and unread

Disaster plans are almost universally prepared for all governmental and institutional entities. They are generally written to comply with some state or Federal regulating commission. They can be invaluable if carefully and practically written and tested[1,14-18] but are instead generally cumbersome, impractical, tedious and unread. This unfortunate tendency leads inexorably to the so-called "paper plan" syndrome.[2,19] This syndrome is grounded in the belief that possession of a written plan guards the factory, hospital, power plant[16,20-21] against mishap or injury in case of disaster.

Possession of a written plan provides a false sense of security. Disaster planning is a process not a product.[2] Writing a practical plan involves considering the effects of a disaster on all aspects and functions of an institution or larger entity. It forces all the personnel who will be interacting in the intervention to meet and exchange ideas and perspectives. These people will have to work together in case of a disaster, and it is imperative that they make a contribution to the plan and familiarize themselves with the roles and capabilities of other personnel and agencies. It is too late to get acquainted at the disaster site.

The plan requires testing and rewriting. A dynamic process of planning is the most important disaster preparedness agenda that a community or institution can embark on.

Drill Procrastination

Tomorrow and tomorrow and tomorrow

A close relative of the "Paper Plan" is "Drill Procrastination". While it is well documented that practice of evacuation plans,[18] equipment malfunction alternatives,[14] medical care delivery in austere field conditions,[13] and many other disaster preparedness exercises vastly improve the effectiveness of workers faced with actual disaster situations, the tendency to postpone drills is almost universal.

Drill procrastination appears to be grounded in three erroneous presumptions. Drills cannot possibly be realistic and therefore do not truly test the disaster team's capability. Drills must be large and must involve every aspect of the response; therefore, they will be terribly time-consuming to plan and administrate, will require more resources and manpower than can be spared, and will not be evaluable in any useful manner. Drills have nothing to do with the normal, everyday functioning of a facility, and, therefore, only serve to appease a commission or prepare for a completely unlikely mass casualty event.

Drills can be realistic. They must be planned according to well-researched principles of disaster epidemiology[5,12,22] with likely numbers and types of casualties for the chosen disaster. Casualties must be coached to act their injuries and must be appropriately moulaged.[23] (Moulage is a process of applying make-up to casualties so that their injuries appear real.) A tone of seriousness must accompany the actions of rescuers and victims. Bad weather and unanticipated flaws in the disaster plan or exercise can create hardships for the participants that restores a sense of reality and increases the value of the exercise.[13]

Most drills should be small and should be directed specifically at testing particular pieces of a plan. This concept of micro-testing requires considerably less planning and administrative effort, spares manpower and resources, and is much easier to evaluate. This approach allows for careful perfection of all components of a plan before any attempt is made to bring them together. Once each voice can be relied upon, the conductor or disaster team leader can step back and observe the functioning of the whole entity without being concerned about the effectiveness of individual units.

This technique of micro-testing answers the argument of practicality as well. The drilling process begins by testing the policies and procedures of a facility or agency and then proceeds gradually to extend the expected boundaries. In this way the disaster plan can be seen as an extension of the normal function. The drilling process provides valuable feedback about ordinary as well as the extraordinary capabilities of personnel and facilities.

Disasters Are Not Large Emergencies

Children are not small adults

By definition disasters overwhelm normal emergency services and require extraordinary intervention. They have a unique epidemiology. They force integration of many agencies and relief specialists that rarely work together. They demand rapid and continuous assessment with intervention responding to that assessment. They will exact the creation of subspecialty skills from providers who wish to participate in interventions.

Disasters are not just large or unwieldy emergencies. By definition they overwhelm normal emergency services and require extraordinary intervention.

Disasters have a particular epidemiology that is just beginning to be defined.[5,24-26] In fact, each particular type of disaster (hurricane, earthquake) has a classifiable and predictable spectrum and scope of injury and illness. These patterns of morbidity and mortality are much more than the sum of the injuries of the individual patients and reflect the larger impact or trauma to the population.

Disaster preparedness and relief calls for the integration and cooperation of many different organizations with various priorities and agenda. When the Air Florida flight crashed into the Potomac in 1982,[4] the relief effort involved Washington Metro Police, Virginia State Police, Washington Fire Rescue, Maryland Trauma teams, the Coast Guard, the Parks Department, the Department of Defense, several Emergency Departments controlling EMTs and paramedics with their base stations, the Department of Transportation, the Highway Department, the FBI, and numerous other federal, state, and municipal agencies. Coordination was difficult.

Disasters require rapid and

continuous assessment and monitoring in order that effective, timely, and appropriate interventions can be provided. Information, documentation, communication, and record keeping are complex.[10,24,25,27] Tools for calculating Disaster Severity Index[26] for measuring the requirements of the disaster in the short and long run are available. Equanimity and objective perception of the site and population needs are vital.

Disaster preparedness and relief demands sub-specialty preparation. Doctors, nurses, paramedics, EMTs, firefighters, Search and Rescue personnel, logistical personnel, and administrators all require special training if they are to acquire expertise in this field.[28] It is naive to imagine that ordinary emergency skills will be easily transferable to the unique exigencies of the disaster.

The Multidisciplinary Response

Who are those guys?

Most disasters demand a multidisciplinary response. This may encompass agencies with varied jurisdiction; emergency organization within a jurisdiction with different skills and priorities: fire, police, rescue, medical teams, hazardous materials decontamination; or different subspecialties on a medical team.

These groups have different and sometimes competing goals and priorities. They have individual disaster plans and training opportunities. Their equipment and approach is often incompatible. When several are present at a disaster site at once, the site coordinator must attempt to command and control the activities of all these groups. Several large, flexible systems have been developed that allow disparate entities to work together under the direction of one leader who may not be known to them before the disaster. The most widely utilized of these is the Incident Command System (ICS),[2] originally created to organize fire fighters but now used in more general disaster contexts.

Communications Disorders

The Tower of Babel

One of the most apparent symptoms of the multidisciplinary approach is a disorder of communication. The problem may be one of equipment or one of vocabulary.

Communications rely on radio. Different communicators are assigned different frequencies or channels. If all the groups at a disaster site used the same channel only static would be heard. But since they generally use different channels, they are unable to communicate. To further complicate the matter, some groups use UHF frequencies exclusively and some use VHF frequencies.

Language, terminology, and codes vary among disaster responders as well, so that even if they could easily speak with each other, there would be great difficulties with comprehension. Mariners have overcome this problem, agreeing to comply with a Global Maritime Distress and Safety System[29] which might serve as a model for international disaster responders. While the problem is considerable in national disasters, it becomes immense in global relief efforts (eg, Khao-I-Dang, a Khmer refugee camp, had relief workers from more than 40 different countries each with a unique language that was not Khmer.)

Over-response

The quality and quantity of mercy

Disaster response is rarely guided by an accurate and dispassionate assessment of needs. Sympathy and altruism are always awakened by the suffering of the victims.[30] Large amounts of unnecessary supplies and unorganized responders often arrive at the site with great intentions but either too late or in the wrong proportions (of goods or skills) to be of much use. This was dramatically illustrated during the Armenian earthquake[24] where officials had to allocate scarce resources to transporting, identifying, and storing supplies that arrived weeks to months after the earthquake.

Rapid and continuing assessment of the site in order to determine actual needs for goods and manpower will lead to a more cost-effective and generally efficacious relief effort.

Micro and Macro Triage

Equity in the numbers game

The word *triage* is derived from the French *trier*, meaning to sort. It was first applied in a medical sense in military combat situations where the injured were sorted so that limited resources were not wasted upon those who were mortally wounded.[31]

Triage has two applications. Micro-triage applies to the sorting of patients at the site and at intermediate holding sites to which they are transferred. Macro-triage refers to the sorting of patients among medical facilities to which they will be transferred from the intermediate site.

Principles of micro-triage are similar to those used in everyday emergency medicine. A simplified color-coding system is usually employed to allow visual identification of patient condition. If medical resources are limited, then certain patients (the most critically injured) will not receive care. Triage scoring systems for determining salvageabilty, like laboratory tests, have error. The trade-off is similar. Sensitive systems over-triage and put a strain on the medical capability of the responders.[11]

Macro-triage attempts to insure distributional equity among hospitals receiving victims. Many studies have revealed[1] that casualties from disasters in the United States tend to be unequally distributed among hospitals in a region. At first one might assume that this was due to quality of care issues reflecting improved capabilities of these centers; however, most surviving patients from disasters have minor injuries, and, thus could easily have been treated at any health care facility. Improper macro-triage leads to over-burdening of the receiving hospital with the potential for delay in treatment of the critically ill.

Public Health Issues Ignored

Don't drink the water

Disasters disrupt public health services. These include water supplies,[32] sewage disposal, housing and energy, food supplies, and preventive health services. These public health problems tend to be ignored in the initial rush to render help to the victims. Often, very little of the acute relief aid is allocated to restoring these vital services. The community or local governing body is generally expected tackle the problem themselves. Any initial assessment of a disaster site must include estimates of the severity of destruction of public health facilities so that temporary and permanent replacements can be budgeted and planned for.

The Unforeseen Aftermath

It's not over till it's over

The aftermath of a disaster includes rebuilding the community infrastructure. The sick must be healed, the injured rehabilitated, and the dead buried.[33] Families reunite, relief workers return home and daily life resumes. While the media and the public generally lose interest in days to weeks, it often requires months or years for the process of normalization to be completed.

Both the victims and the rescuers often suffer serious psychological problems that inhibit their reintegration back into normal life. These problems have been the object of much recent study and often are swept into the diagnosis of Post-Traumatic Stress Disorder. Disaster victims[34,35] often have ambivalence about learning the full extent of the disaster, delayed mourning when the bodies of relatives cannot be found, somatic expressions of anxiety and fear, and a tendency to use primitive defenses such as magical thinking.[36] Psychological counseling services are rarely offered in the initial relief efforts, but the effects of these problems may be more debilitating to the community than any others.

Care givers are also quite prone to stress disorders in disaster situations.[37] A program of Critical Incident Stress Debriefing (CISD) has been developed and tested extensively in this country.

Hazardous Materials

The hidden costs of synthetics

Among man-made disasters is that involving hazardous materials. Industry in the United States employs hundreds of thousands of compounds that are toxic to humans. Explosions, fires, and spills during transport create disasters. The most dramatic recent disaster occurred in Bhopal, India where hundreds of people died and thousands more were severely and often permanently injured.

In the United States Right-to-Know Laws passed in 1986 mandated that every facility using, storing, or manufacturing hazardous chemicals make public its inventory and report every release of a hazardous chemical to public officials and health personnel. Companies are also forced to cooperate with physicians who are treating victims of exposures.[38]

Disaster responders who treat victims of so-called Haz-Mat incidents must have special training and equipment.[39] The rescuers must protect themselves from the effects of the chemicals. This requires barrier clothing and respirators. The victims must be decontaminated as they are being treated. Preparation for these disasters has been helped by computer modeling[40] that can accurately predict the extent and effects of various types and quantities of spills. As with most disaster preparedness and response planning, the apparent low probability of these incidents, combined with the difficulty and cost of training and equipping teams to intervene if an incident occurs, has left most states ill-prepared to deal with the medical and environmental consequences of a release.

National Disaster Medical System

The National Disaster Medical System was initially created by the federal government to provide medical care in the event of catastrophic natural disasters within the United States.[41] The system includes hospital facilities, evacuation assets, and medical response teams. The administrative guidance for NDMS involves a coalition of the United States Public Health Service, the Federal Emergency Management Agency, the Department of Defense, and the Veterans' Administration.

The National Disaster Medical System was initially created by the federal government to provide medical care in the event of catastrophic natural disasters within the United States.

These four agencies oversee a system whose role has gradually expanded so that its facilities can be activated on a regional or local level to deal with disasters of all sizes. Private hospitals have committed substantial numbers of beds for use in a disaster. In Rhode Island all the hospitals have agreed to participate in NDMS committing more than 1,000 beds for use in extraordinarily catastrophic circumstances. The Department of Defense provides transport vehicles and personnel. Civilian volunteers staff the medical response teams called Disaster Medical Assistance Teams (DMATs).

Disaster Medical Assistance Teams

DMATs are the civilian medical response teams of the NDMS. They are similar in composition and capability to disaster teams created in France and Germany.[42,43] A DMAT is composed of physicians, nurses, paramedics, EMTs, and other medical and logistical support personnel.

Their function in a local, regional, or national disaster is clearly defined. They have the capability to travel to a disaster site on short notice; organize medical facilities at the site; perform search and rescue; transport patients to the triage site; perform triage; stabilize patients at the triage site; arrange for patient transport to admitting hospitals; package patients for transport; care for patients en route; and deliver patients to the admitting hospital.

DMATs must be self-contained,[44] providing their own living facilities, medical care, food, clean water, and waste disposal at the disaster site. They are trained to set up, maintain, and take down these facilities. The DMAT must function independently. The disaster site and the population affected cannot be presumed to offer scarce or absent resources to the medical response team.

The Rhode Island DMAT (RIDMAT 01) consists of 120 volunteers, almost all of whom have extensive emergency medicine experience. The team is available to intervene in disasters in Rhode Island and throughout the northeast, as well as nationally. The team conducts didactic and practical training exercises in logistics, medical response, and on-scene environmental living. Proper training is essential for effective function, coordination, cohesion, and sometimes, survival.[45]

The Gulf War

When the Gulf War began RIDMAT 01 went on alert along with the Rhode Island section of NDMS. A memorandum of preparedness was sent to all DMAT members (Table 1). DMAT members invoked an every fourth day call schedule so that

Table 1. Memorandum of Preparedness

For all DMAT members and prospective members

January 18, 1991

1) We are the only functional DMAT in the Northeastern Corridor of the United States.
2) Most of the Reservist physicians and nurses have been called to active duty and sent to the Gulf.
3) Casualties of the war will be airlifted from European hospitals or directly from Saudi Arabia to Hub cities in the United States. One of those Hubs is Boston.
4) Some casualties will then be airlifted from Boston to Spoke cities. One of these is Providence.
5) If enough casualties occur that airlifting to the United States is required, we will be mobilized. We will be asked to go to Boston's Logan airport and function as a receiving medical team. We may also assume this role at a later time at Green Airport in Rhode Island.
6) At the Airports we will be expected to perform the following duties: Receiving casualties from C-130 and C-5 transport planes; triaging these casualties after brief physical exam; restabilizing any casualties who have destabilized during transport; managing casualties in a Triage Site that we have set up at the airport; contacting area hospitals in order to arrange beds for transfer; packaging patients for transfer; and assisting in transfers whenever possible.
7) Medical duties may include: Triage, managing airways and oxygen, managing fluids, stabilizing bony injuries, and changing and improving dressings.
8) The DMAT is a voluntary organization; however, if you wish to participate once we are mobilized, your place of employment must allow you to go. It is unlikely that in the face of this tragic occurrence any Americans will question your sense of duty or responsibility to care for our wounded troops.
9) One of the strongest feelings that overwhelms those of us who are stateside is a sense of impotence. We are not fighting, and it does not appear that there is anything that we can do to help. Participating in the DMAT mobilization will allow you to do your part to help your country and its brave fighting men and women at the time of their greatest need.
10) I look forward to working with each and everyone of you in the coming weeks.

a complete sub-team would always be prepared to respond. Rhode Island Hospital created and stocked a depot of disaster mobilization supplies. DMAT leaders met with representatives of the Hospital Association of Rhode Island in order to coordinate casualty reception activities. DMAT leaders met with the Rhode Island Emergency Management Agency, the Newport Naval Hospital personnel, and administrators from the Davis Park VA Hospital. Sites at TF Green and Quonset airports were evaluated and recommendations and action plans were prepared.

In the event of large numbers of American casualties, the NDMS and DMATs were prepared to assist in the reception of casualties. The NDMS would have been activated, thus opening many civilian hospital beds for injured servicemen and women. The DMATs would have served as receiving teams at airports where large numbers of casualties were to be delivered.

The DMATs would have set up field triage sites at the airports to collect, re-triage, and stabilize incoming casualties. Then the team would have arranged for admission for servicemen and women in participating NDMS civilian hospitals. RIDMAT 01 was prepared to serve this function, but fortunately they were not needed.

Conclusion

Disaster medicine and the expanded disciplines of disaster preparation and response are new and growing fields in the realm of health care delivery services. As with all new fields the knowledge base is limited but expanding rapidly. Difficulties will be overcome and answers to dilemmas discovered in the very process of intelligent and objectively scientific approaches to disaster relief.

References

[1] Duffy, John C., (Editor) Health and Medical Aspects of Disaster Preparedness Plenum Press, 1990.

[2] Auf Der Heide, Eric, MD, Disaster Response: Principles of Preparation and Coordination, 1989, CV Mosby Company.

[3] Reis, ND and Dolev E, editors Manual of Disaster Medicine, Springer-Verlag, 1989.

[4] Proceedings of the First International Assembly on Emergency Medical Services, June 1982, The United States Department of Transportation and the National Highway Safety Traffic Administration, "Mass Casualties: A Lessons Learned Approach".

[5] The Public Health Consequences of Disasters, 1989, (editors) Gregg, MB, MD, French, J, PhD, Binder, S, MD, and Sanderson, LM, PhD, US Department of Health and Human Services, Public Health Service, September 1989.

[6] Bickler, G, et al, Community Medicine, 1988, November 10 (4):314-318.

[7] Cavelier, J, Bull-Acad-Natl-Med, Paris, 1988, November 172 (8):363-366.

[8] Sloan, KA, Journal of Emergency Nursing, 1990, July-August 16 (4):263-268.

[9] Morris, FH, et al, Am J Co Psych, 1988, October 16 (5):665-683.

[10] deBoer, J, Journal of Emergency Med. 1989, September-October 7 (5):481—484.

[11] Frykberg, ER, et al, Annals of Surgery, 1988, November 208 (5):569-576.

[12] Rowlands, BJ, Injury, 1990, January 21 (1):61-62.

[13] Davis, RE, et al, Milit Med 1990, February 155 (2):80-83.

[14] Ammons, MA, et al, The Journal of Trauma, 1988, October 28 (10):1468-1471.

[15] Arandelovic, S, et al, Vojnosanip-Pregl, 1990, March-April 47 (2):83-90.

[16] Desai, E, Soc-Sci-Med, 1990, 30 (10):1065-1072.

[17] Adams, RD, injury, 1990, January 21 (1):17-20.

[18] Mangum, WP, et al, Gerontologist 1989 June 29 (3):388-392.

[19] Troest, A, Ugeskr-Laeger, 1990, September 1452 (38):2709-2711.

[20] Linnemann, RE, J Med Assoc. GA, 1989, February 78 (2):95-100.

[21] Linnemann, RE, JAMA, 1987, August 7, 258 (5):637-643.

[22] Rutherford, WH, Injury, 1988, November 19 (6):384-388.

[23] Hindman, B, et al, Journal of Emergency Nursing, 1988, 14(5): 316-317.

[24] Noji, EK, et al, Annals of Emerg Med 1990, August 19 (8):891-897.

[25] Sanchez-Carrillo, CI, Public Health Reports 1989, September-October 104 (5):482-488.

[26] deBoer, J, Journal of Emerg Med 1989 May-June 7 (3):269-273.

[27] Martin, TE, J-R-Army-Med-Corps, 1990, February 136 (1):19-26.

[28] Ballesteros, JA, et al, Rev-Clin-Esp 1989, January 184 (1):27-33.

[29] Jones, P, J-R-Nav-Med-Scrv, 1989, Spring 75 (1):41-45.

[30] Russell, GW, et al, J. Soc. Psychol. 1990, June 130 (3):309-316.

[31] Kourbil, LJ, The Bull-Acad-Natl-Med, Paris 1988, March 172 (3):333-346.

[32] Loscher, J, Z-Gesamete-Hyg 1989 April 35 (4):193-195.

[33] Hooft, PJ, et al, Forensic-Sci-Int. 1989 January 40 (1):3-14.

[34] Raphael, B, Acta-Psychiatr-Scand-Suppl. 1989, 353:175.

[35] Lima, BR, et al, Acta-Psychiatr-Scand. 1989 January 79 (1):74-82.

[36] Cohen, RE, Hospital-Community-Psychiatry 1987, December 38 (12):1316-1321.

[37] Fain, RM, et al, Med-Educ 1989 January 23 (1):91-96.

[38] Leonard, RB, et al, Annals of Emergency Med 1989, November 18 (11):1212-1216.

[39] Plante, DM, J-Emerg-Med 1989, January-February 7 (1):55-64.

[40] Baxter, PJ, Br-J-Int-Med 1989 April 46 (4):277-285.

[41] Mahoney, LE, et al, Annals of Emerg Med 1987, September 16 (9):1085-1091.

[42] Handschak, H, Anaesthesiol-Reanim, 1990, 15(1):9-18.

[43] Barrier, G, Critical Care Medicine, 1989, October 17 (10):1062-1067.

[44] Rodenbeck, SE, Milit Med 1990, January 155 (1):12-13.

[45] Hytten, K, Acta-Psychiatr-Scand Suppl, 1989, 355:73-78.

TALK ABOUT
PRESCRIPTIONS

LAW OFFICE
OF
HERBERT M. ADAMS, J.D.

GENERAL LAW PRACTICE
MEDICAL COLLECTIONS

GOVERNOR FINANCIAL CENTER
P.O. Box 2502
285 Governor Street
Providence, Rhode Island 02906
(401) 421-1364

OFFICE EQUIPMENT

AVAILABLE

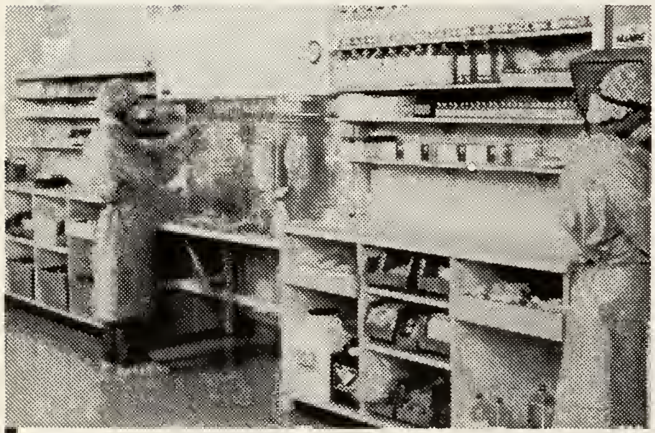
Including examination tables, instruments, file cabinets and desks. Multiple bound journals consistent with General Surgery, Thoracic Surgery and Cardio-Vascular Surgery.

For information call

508-675-0121

CLINICAL I.V. NETWORK

The Margin of Difference in Home Infusion Therapy



IV ANTIBIOTICS, CHEMOTHERAPY, IV PAIN MANAGEMENT, TPN AND OTHER INFUSION THERAPIES

CLINICAL IV NETWORK is affiliated with VNA of Rhode Island

YOU MANDATE SERVICE.

All of our nurses are experienced in the latest high-tech therapies. Through commitment and experience, our nurses provide . . .

THE MARGIN OF DIFFERENCE.

CALL 401/751-9120
67 CEDAR ST. • SUITE ONE • PROVIDENCE, R.I. 02903

You treated little Johnny for measles in kindergarten, chicken pox in 3rd grade, mono in high school.

But what can you do for his HIV today?

People with HIV are special patients with specific needs. That's why it helps to have experience with HIV when treating an infected patient–the kind of experience doctors find at Clinical Partners.

Clinical Partners is a group of healthcare professionals dedicated to helping patients live with HIV. We are alone in the complete array of services we provide to physicians, employers and insurers of those living with HIV. Our early intervention averts costly hospital stays, while increasing patient care and support.

Operating successfully in Boston, New York and Los Angeles, Clinical Partners is pleased to announce the first anniversary of our Providence office, under the expert guidance of Linda Durand NP, RNC and Deborah Matson CISW, MSW.

We want Rhode Island physicians to know Clinical Partners is here to help, and here to stay. As the patient's primary physician, you can benefit from our knowledge and experience, which is available to help you treat HIV infection and AIDS.

To find out how Clinical Partners can be your partner in treating HIV patients, call our Providence office today at 454-8880 or 1-800-285-8880.

Clinical Partners

Helping people make choices about HIV.

HEALTH BY NUMBERS

Rhode Island
Department of Health
H. Denman Scott, MD, MPH
Director of Health

From Emergency Department to Inpatient: Rhode Island Injuries 1988

Traumatic injuries comprise a large portion of the cases which require emergency medical services (EMS). The serious injuries in Rhode Island which burden the EMS system can be studied through hospital discharges. From October 1, 1987 through September 30, 1988, there were 8,368 discharges from Rhode Island hospitals with injury as the principal diagnosis.* Of these, 6,078 (72.6%) were admitted through emergency departments.

Diagnostic codes indicating the external cause of injury ("E-codes") are provided for 3,632 (59.8%) of the injury discharges in this time period. As shown in Figure 1, falls are the leading cause of injury hospitalization via emergency departments. Motor vehicle crashes (MVCs), which include injuries to motorcyclists, bicyclists, and pedestrians, and self-inflicted injuries are also prominent causes. In contrast, analysis of death certificates indicates that MVCs are the leading cause of injury death, followed by suicides and falls.[1] While E-codes are not provided for all hospitalized injuries, the ranking of causes is unlikely to be affected since coding is not strongly correlated to injury cause. However, complete E-coding of injury discharges (now required in Rhode Island) will provide a more definitive picture of injury causes.

Figure 1. Causes of Injury for Hospitalizations Admitted Through the ED, For E-Coded Injuries, Rhode Island, 1988

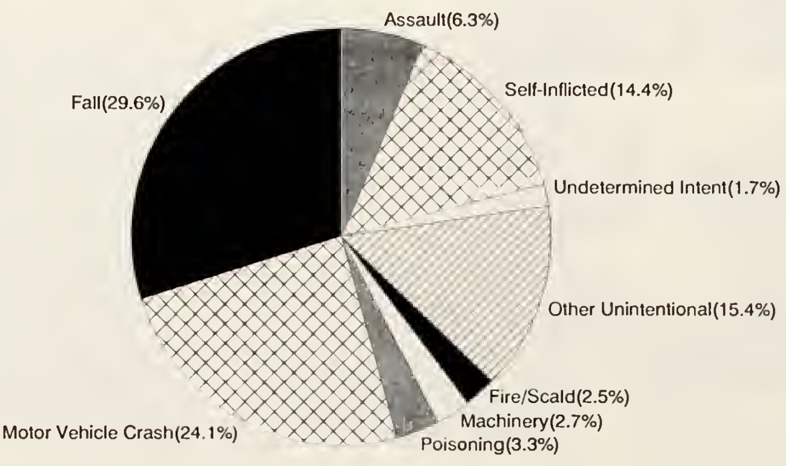


Figure 2 illustrates the discharge rate by gender and age group. The male/female rate ratio increases with age up to the 25-34 age group, where males have two-and-a-half times (248%) the discharge rate of females. Women's injury discharge rate then increases and by the end of the lifespan, women have almost twice (184%) the discharge rate of men. For both sexes the discharge rate is highest for those 75 and over (1,095 and 2,015 per 100,000 for males and females, respectively). The leading cause of injury in this age groups is falls. Injuries among males aged 15-34, another high risk group, are caused primarily by MVCs and intentional injuries (assault and self-inflicted).

Discharge disposition provides some indication of the severity of the injuries. Most discharges (74.3%) were routine,

---

**This excludes diagnoses of adverse drug reaction, medical misadventure, and late effects.*

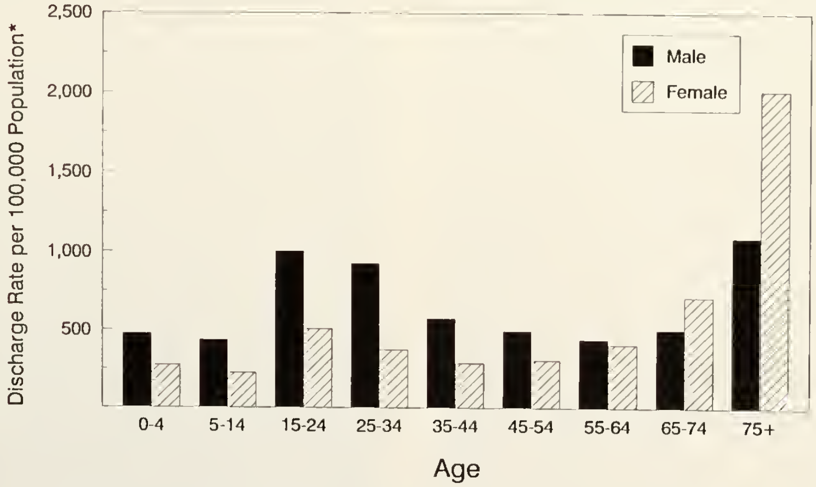
Submitted by the Injury Prevention Program, Ann Thacher-Renshaw, Project Director, Thomas Largo, Project Epidemiologist.. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

while 23.3% of the patients required further medical attention or left the hospital against medical advice. Two and a half percent (2.5%) of the patients died prior to discharge. Note that some patients may have died subsequent to discharge, but this data set does not provide this information. Table 1 lists frequencies of principal injury diagnoses and discharge fatality rates. These diagnoses are the condition responsible for hospital admission, not necessarily the cause of death in fatal injuries. Fractures were by far most prevalent, followed by poisoning/toxic effects, open wounds, and intracranial injuries. Discharge fatality rates were highest for internal, intracranial, and fracture injuries. Among internal and intracranial injuries, MVCs were the leading cause of injury; it should be noted that falls were associated with a large number of intracranial injuries. Among fractures, falls were the leading cause of injury.

Table 1. Principal Diagnoses and Discharge Fatality Rates for Injury Hospitalizations Admitted Through the ED, Rhode Island, 1988

Principal Diagnosis	Discharged Number (%)	Dead (%)
Fracture	2867 (47.2)	79 (2.8)
Poisoning/Toxic Effects	800 (13.2)	11 (1.4)
Open Wound	682 (11.2)	3 (0.4)
Intracranial	490 (8.1)	18 (3.7)
Dislocation/Sprain	215 (3.5)	2 (0.9)
Superficial/Contusion	200 (3.3)	1 (0.5)
Internal	188 (3.1)	16 (8.5)
Burn	174 (2.9)	2 (1.1)
Foreign Body	92 (1.5)	1 (1.1)
Crushing	26 (0.4)	0 (0.0)
Other	344 (5.7)	16 (4.7)
TOTAL	6078 (100.0)	149 (2.5)

Figure 2. Discharge Rates for Injury Hospitalizations Admitted Through the ED, by Age and Gender, Rhode Island, 1988



*Based on 1990 RI Population Projections

References

1 Zimmerman, H., Goulet, R. A Compendium of Rhode Island Injury Mortality Data, 1979-1988. Providence, RI: RI Department of Health, September 1990.

THE RHODE ISLAND MEDICAL JOURNAL
The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

VOLUME I
NUMBER 1
PROVIDENCE, R. I., JANUARY, 1917
PER YEAR $2.00
SINGLE COPY, 25 CENTS

THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago (August, 1901)

Stephen Welch, MD, writes an article relating his personal experiences with transient (or simple) glycosuria which he distinguishes from diabetes mellitus. He regards the condition as essentially benign and lists the following circumstances as exciting causes: Colds, influenza, tiresome trips and hearty meals with such carbohydrate-containing foods as rice, white bread and corn meal. *(Ed. Note: It is worth commenting that the typical Journal article of the turn of the century bore at least four characteristics which distinguished it from our current Journal contributions: [1] The articles were almost always written by one person and reflected an intensely personal point of view. They were occasionally rambling, discursive and polemical, but almost never did they follow a set formula. [2] The articles were essentially essays without the modern subtitles and divisions [eg, Discussion, Conclusion, etc] [3] References were rarely if ever employed, and [4] the metric measuring system was never used. Thus, for example, in Welch's article, the composition of Haines' solution for the identification of sugar in urine, is described in pharmaceutical terms as follows: pure cupric sulphate, 30 grains; distilled water, one-half ounce; mix and add pure glycerine, one-half ounce; liquor potassae 5 fl ounces.)*

George S. Mathews, MD, describes his experience with endocardial and exocardial murmurs which he detected and recorded during the first quarter of the year 1900 while working in the out-patient department of Rhode Island Hospital. His endocardial murmurs are subdivided into those which are functional and those which are organic. The major functional murmur, a systolic hemic murmur he believes to originate in progressive dilatation of the pulmonary artery. Amongst the organic murmurs, he notes only one presystolic murmur ("in a male of 18 who had rheumatism of the knee.") The most constant ("and least elusive") of the organic murmurs in his experience was the murmur of aortic regurgitation.

Of the exocardial murmurs, the author describes three diagnostic categories: (1) pericardial murmurs, (2) cardiorespiratory murmurs and (3) venous hums.

He concludes: "We are all aware of how many of these (organic murmurs) are found in persons who have never been conscious of any defect in their cardiac apparatus and who may live for many years and lead a "strenuous life" without suffering a modicum of discomfort. (The author refers to observations by numerous authorities including Corrigan, Jacobi and Mackenzie, but does not provide the reader with any literature citations.)

George D. Hersey, MD, describes an angiosarcoma of the left shoulder necessitating an "en masse" amputation of the arm and shoulder. The patient was a married woman, 20 years of age. Despite the radical surgery there was recurrence and metastases and the woman died nine months later. The pathologist, FT Fulton, MD, describes the neoplasm in great histological detail.

Fifty Years Ago (August, 1941)

The lead article is a survey of

the clinical application of sex hormones and is written by Willard Thompson, MD, and Norris Heckel, MD. The authors first describe the physiologic functions of sex hormones and enumerate the secondary sex characteristics in both male and female. There follows, then, a brief discussion of the chemical structure of androgenic and estrogenic substances, both natural and synthetic. Indications for sex hormone substitution therapy (in the male) are: primary hypogonadism, and secondary hypogonadism, including some instances of Frohlich syndrome, chromophobe adenomata and other forms of pituitary dwarfism. Adequate therapy, say the authors, will result in the appearance of secondary sex characteristics, an increase in appetite, vigor, and basal metabolism. Indications for sex hormone substitution therapy in the female are: primary hypogonadism (including menopause), some instances of dysmenorrhea, and some cases of secondary hypogonadism. The authors conclude with the following general rule for treatment of hypogonadism: "In any case of hypogonadism in either sex, try stimulation therapy first and resort to substitution therapy if it fails. As already indicated, treatment with sex hormones is substitution therapy and treatment with various gonadotropic principles, stimulation therapy.

JE Donley, MD describes the Newport, Rhode Island, sojourn of Bishop George Berkeley, the eminent English cleric, in the year 1720. Berkeley's intent had been to establish "an important center for the Propagation of the Gospel in Foreign Parts", possibly beginning a missionary seminary tentatively to be called St Paul's College. Berkeley's interest to the medical profession, however, rests in his advocacy of tar-water as a panacea for a variety of unrelated medical disorders. "Tar is obtained from all sorts of pines or firs from which it can be drawn off in various ways. The juice of pines and firs consists of aqueous, oily and saline particle. Pines and such-like trees are especially rich in acid or vegetable soil. The juice, acted on by the sun, is strained in to a balsam; the vegetable soul or acid is drawn off by water and a most noble medicine is the result." Edmund Burke wrote in 1774, "I am sure that tar is the universal medicine here notwithstanding the opposition of its enemies, the physicians."

Drs IC Nichols and HW Williams offer a paper entitled, A Communication on Selective Service. The authors state that "Soldiering is a vocation requiring good physical stamina, but, perhaps more important, certain personality characteristics." They implore their colleagues, particularly those with the Selective Service Board to weed out those who will not be capable of making the adjustment to military life. "The Government is relying heavily on us to send material from which a real Army may be produced."

A memorial editorial is written following the death, on January 31, 1941, of Dr Charles Vague Chapin.

The *Journal* prints the following excerpt, without comment, from the Code of Ethics, AMA: "A physician should avoid making social calls on those who are under the professional care of other physicians without the knowledge and consent of the attendant. Should such a friendly visit be made, there should be no inquiry relative to the nature of the disease or comment upon the treatment of the case, but the conversation should be on subjects other than the physical condition of the patient."

Twenty-Five Years Ago (August, 1966)

Alex M. Burgess, MD, and Samuel B. Burgess, MD write an article on Chronic Obstructive Pulmonary Emphysema, a review with special reference to its relationship to cigarette smoking. They observe that: "smoking experience is hard to measure because some individuals habitually inhale much more smoke from a single cigarette than do others. Furthermore, a person's estimate of the amount of smoking he does is usually an inaccurate guess, and denial of smoking may of course be an offhand falsehood. Nevertheless, a simple study of records such as we have made, in which a careful search for instances of non-smokers with emphysema has disclosed such a small percentage is, to say the least, suggestive."

HS Strauss, MD, offers a progress note on Aspects of the Management of Hemophilia in Children, emphasizing the availability of newer concentrates of hemophiliac factor. He describes three forms of Factor VIII concentrate being used in this country: Cohn's Fraction I (derived by ethanol precipitation with a seven-fold concentration over pure plasma); a cryoprecipitate (by the slow thawing of freshly frozen plasma); and a glycine-precipitated concentrate, representing a 20-fold concentration. (*Ed.*

Note: No mention is made, in 1966, that pooled plasma fractions used for therapeutic purposes, may be the inadvertent source of viral transfer to the recipients of such concentrates.)

JA Yacovone, DMD, writes on the basic concepts for a dental health education program in the schools of Rhode Island.

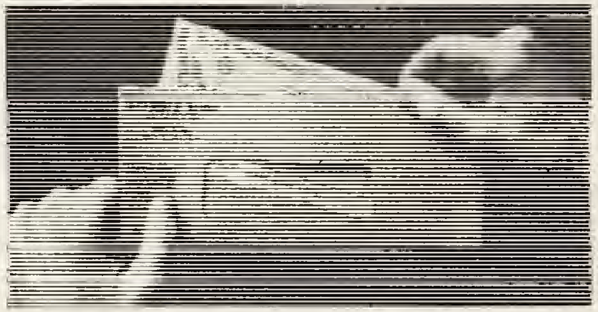
JE Cannon, MD, EB Byrne, MD, and BJ Rosenstein, MD, describe recent changes in the regulations for the reporting of communicable human disease in Rhode Island. The reportable diseases are in three categories: Category 1: identity of persons afflicted not required (eg mumps, influenza, etc.) Category 2: identity of afflicted persons required (eg, cholera, plague, smallpox, etc.) Category 3: identity of persons afflicted required, but information kept confidential (eg, venereal disease, tuberculosis).

An editorial on driving safety describes the hazards of a new phenomenon called the superhighway. The editorial prints prudent driving rules distributed by the agency managing the new Connecticut Turnpike (eg, do not enter the highway unless you have an abundant supply of gasoline).

Another editorial observes that the nursing shortage is becoming more acute. A survey in Michigan declares that by 1970 the state will need 16,000 more practicing nurses than are now available. Yet other groups envision a 20% shortage in nurses by the next decade, " . . .a grim outlook indeed."

An editorial on the number of available hospital beds states: "Much has been written about the curse of over-utilization of hospital beds. It has been broadly implied that we have plenty of hospital beds if only unnecessary admissions were curtailed and the hospital stay were reduced 0.1 of a day. That the problem is in no wise that simple is abundantly clear. In the first place population growth, increasing longevity, medicare, fedicare (title XIX) will generate progressively greater need for beds. The obsolescence of hospital beds has been almost totally disregarded in the hue and cry." "A survey by the United States Public Health Service completed in 31 states indicates that 32.4 percent of general hospital beds now in use fail to meet acceptable standards."

WE'LL HELP YOU PAY OFF $20,000 OF YOUR MEDICAL SCHOOL LOANS.



If you're certified in one of the following specialties:
■ anesthesiology ■ general surgery ■ thoracic surgery ■ orthopedic surgery ■ neurosurgery ■ emergency medicine
you could take part in the Army Reserve's Health Professionals' Loan Repayment Program that pays as much as $20,000 in medical school loans.

As a member of the Army Reserve, you could be serving your country near home at times convenient to you. You'll also enjoy all the prestige and privileges that accompany being an officer.

To find out more about the Health Professionals' Loan Repayment Program and all the other advantages of the Army Reserve, contact one of our experienced Army Reserve Medical Counselors. They can arrange for you to talk to an Army Reserve physician and visit a Reserve Center or medical facility.

Call collect: 203-624-5325
Or write: Cpt. John Grimes, US Army Medical Dept., 414 Chapel Street, New Haven, CT 06511

BE ALL YOU CAN BE.®
ARMY RESERVE

Join The AMA.

"This is a time when we need a unifying force in the medical profession very badly.

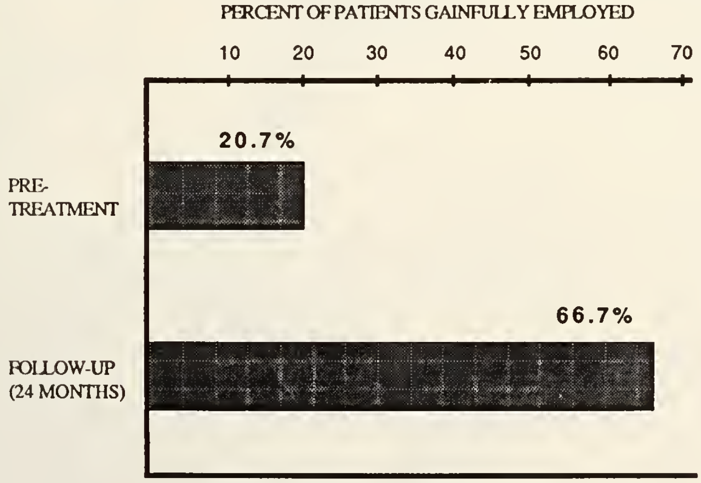
"As a member of the AMA, I'm part of an organization that's involved in my life work and through it, I feel I have a relationship with other doctors. Together, we're all working toward the improvement of the medical profession and our relationship with our patients. And that's what the American Medical Association is all about."

Join Dr. Michael E. DeBakey, Chancellor and Chairman, Department of Surgery, Baylor College of Medicine, in the AMA. Call this toll-free number now.

1-800-AMA-3211

American Medical Association

"CHRONIC PAIN DOESN'T HAVE TO MEAN CHRONIC DISABILITY FOR YOUR PATIENTS..."



The Chronic Pain Treatment Program
(401) 751-9150

Institute for Behavioral Medicine
120 Wayland Avenue
Providence, Rhode Island 02906-4318

INFORMATION FOR AUTHORS

Manuscripts: Manuscripts will be accepted for consideration with the understanding that they are original contributions, have never been published or submitted elsewhere, and are submitted only to the *Rhode Island Medical Journal.*

Specifications: Manuscripts must be original typed copy (not all capitals) on 8½ × 11 inch firm typewritten paper, double-spaced throughout (including title page, text, acknowledgments, and references) with margins of at least one inch and using but one side of each page. Tables, charts, and legends should be submitted separately from the text, and referred to by number (ie, Fig. 1) within the text. Subheadings must be inserted at reasonable intervals to break the typographic monotony of the text. Pages must be numbered consecutively. Italics and boldface print are never used except as subheadings.

Abbreviations: The *Journal* attempts to avoid the use of jargon and abbreviations. All abbreviations, especially of laboratory and diagnostic procedures, must be identified in the text.

Title Page: All manuscripts must include a title page which provides the following information: (1) a concise and informative title; (2) the name of the author or authors with their highest academic degree (ie, MD, PhD); (3) a concise biographical description for each author which includes specialty, practice location, academic appointment, and primary hospital affiliation; (4) mailing address and office telephone of principal author; (5) mailing address of author responsible for correspondence or reprint requests; (6) source of support if applicable.

Illustrations: Authors are urged to use the services of professional illustrators and photographers. Drawings and charts should always be done in black ink on white paper. Clear, black and white 5 × 7 glossy photographs should be submitted, and such illustrations numbered consecutively and their positions indicated in the text. Original magnifications should be noted. Illustrations defaced by handwriting or excessive handling will not be accepted. The figure number, indication of the top, and the name of the author must be attached to the back of each illustration. Legends for illustrations should be typewritten on a single list, with the numbers corresponding to those on photographs and drawings. Recognizable photographs of patients are to be appropriately masked and must carry with them written permission for publication. Special arrangements must be made with the editors for excessive numbers of illustrations. Color plates are not acceptable.

Identification of Patients: Names, initials should not be used. Use of numbers is a preferable form of identification.

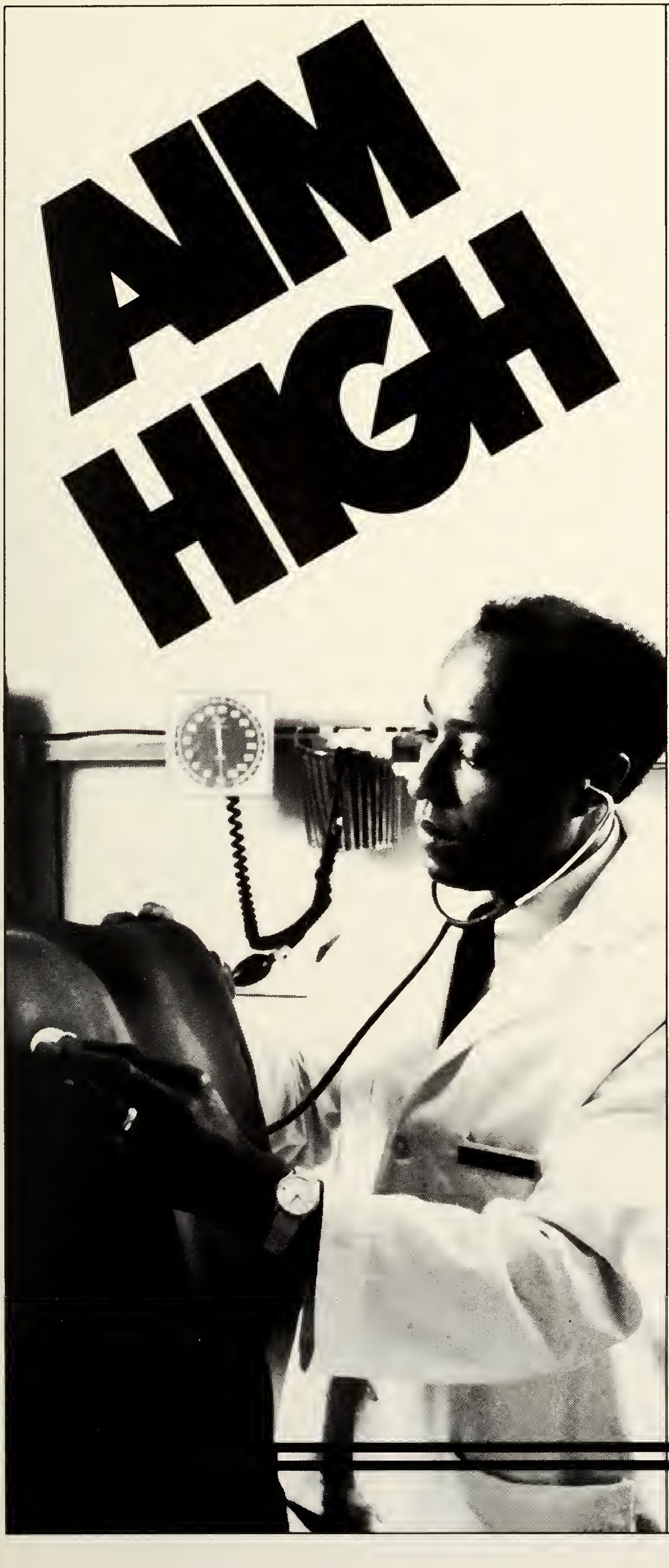
Reprints: Because of cost considerations, reprints are not provided routinely to the author(s). Reprints may be ordered separately (100 copies minimum order) and printing costs will be charged to the author(s).

Responsibility: Manuscripts are subject to editorial revisions as deemed necessary by the editors and such modifications will be undertaken so as to bring them into conformity with *Journal* style, which is in compliance with the editorial standards of the AMA. However, neither the editors, nor the publishers, nor the Rhode Island Medical Society will accept responsibility for statements made or opinions expressed by any contributor in any article or feature published in the pages of the *Journal.*

Permission: When material is reproduced from other sources, full credit must be given both to the author and publisher of these sources. Where work is reported from a governmental service or institution, clearance by the appropriate authority must accompany the manuscript.

References: To conserve space and expense, references should be limited to those essential to the subject. The editor reserves the right to reduce the number when it is deemed necessary. The references must be double-spaced and numbered as they appear consecutively in the text, with their positions clearly indicated in the text. All references must be checked to assure complete accuracy. Each journal reference must include the full name of the author(s); complete title of paper; name of publication; volume number; issue number; first and last page of paper; and date (year, month, and day as indicated). Each book reference must include the full name of author(s), editor(s), or both, with initials; title of book; edition; publisher; location; year of publication, volume (if given); and page number. If the reference is to a chapter within a book, the author of the chapter, if different than the author of the book, and the title of the chapter (if any) must be provided.

Correspondence: All correspondence relating to publication should be addressed to: Managing Editor, *Rhode Island Medical Journal,* 106 Francis Street, Providence, RI 02903.



SPECIALIZE IN AIR FORCE MEDICINE.

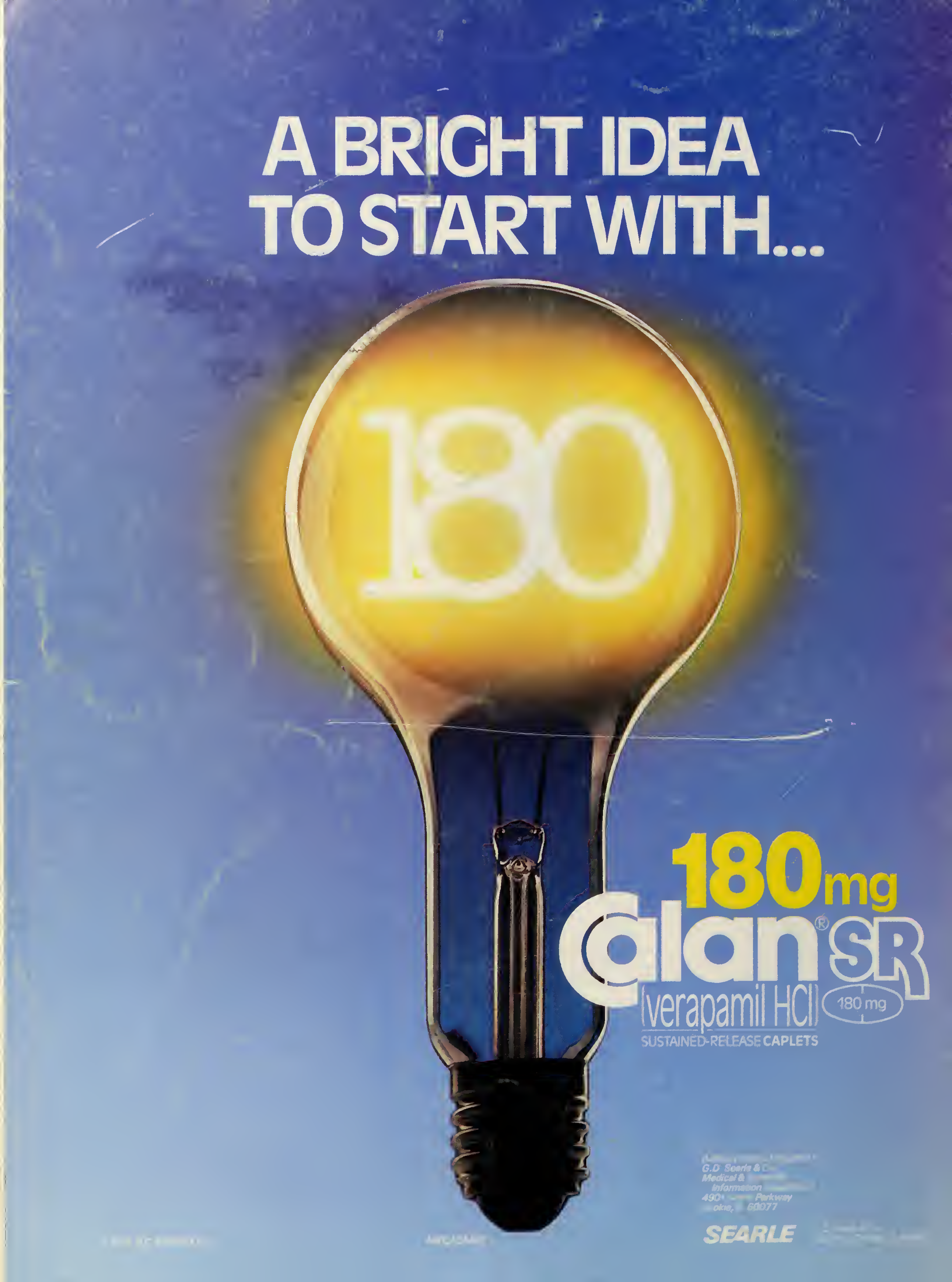
ER Physicians. Radiologists. OB/GYNs and other specialists! Today's Air Force gives you the freedom to specialize without the financial overhead of running a private practice. Talk to an Air Force medical program manager about the tremendous benefits of becoming an Air Force medical officer:

- No office overhead
- Dedicated, professional staff
- Quality lifestyle and benefits
- 30 days vacation with pay each year

Examine your future in the Air Force. Learn if you qualify. Call

USAF Health Professions
Toll Free
1-800-423-USAF

AIR FORCE



[illegible]
G.D. Searle & [illegible]
Medical & [illegible]
Information [illegible]
490[illegible] Parkway
[illegible]okie, [illegible] 60077

SEARLE